THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$1.50 A COPY; $44/YEAR | JANUARY 23, 1984 | VOL. XVIII, NO. 4

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NEWSPAPER

UNIX: *The operating system of the '80s? Major developments at Capitol meeting*

DEC unwraps Ultrix-32

WASHINGTON, D.C. — Digital Equipment Corp. last week became the second major firm to introduce a Unix-based operating system when it announced Ultrix-32 for mid-range and high-end VAX-11 superminis. DEC's announcement at the Uniforum International Conference of Unix Users here came just one week after IBM unveiled its Unix version for the Personal Computer and Personal Computer XT.

Ultrix-32 joins VMS as the second operating system for the VAX-11 line. Based on technology from the University of California at Berkeley's Fourth Berkeley Software Distribution, Ultrix-32 is targeted principally at laboratories, universities and technical and commercial OEMs for value-added system development, computer-aided design and robotics.

The software is an interactive, virtual memory, time-sharing system that supports up to 16 users on a VAX-11/730, more than 32 users on a VAX-11/750 and 64 or more users on a VAX-11/780. It reportedly features a hierarchical file system with demountable volumes for improved performance, sharing of I/O resources among processes and asynchronous process execution.

Users who order the Ultrix-32 system will receive a Unix binary license directly from DEC, a spokesman said. An Ultrix-32 license can also be ordered as part of a VAX-11 System Building Block for new system purchasers or as an add-on product for either VAX/VMS users or VAX-11 customers with a third-party Unix license.

Deliveries of the Ultrix-32 operating system are planned for late spring. System Building Block kernels, including a VAX-11 processor, 2M bytes of memory and Ultrix-32 software, are priced at $23,500 for the VAX-11/730, $52,500 for the VAX-11/750 and $150,500 for the VAX-11/780 from DEC, Maynard, Mass. 01754.

AT&T, Digital Research tied

By John Gallant
CW Staff

WASHINGTON, D.C. — AT&T Technologies, Inc. and Digital Research, Inc. last week jointly announced a "cooperative relationship to expand the number of Unix System V applications software offerings."

Speaking at a press session at the Uniforum International Conference of Unix Users here, Jack Scanlon, vice-president of computer systems for AT&T, and Digital Research President John Rowley highlighted plans to develop jointly a Unix System V applications library for microcomputers. The applications library will include a line of applications and systems software designed to operate on several different microprocessors that run Unix System V.

For Digital Research, the agreement represents another major step into the Unix marketplace since it comes hot on the heels of the company's recently announced agreement with Motorola, Inc. (see story page 6). That agreement calls for Digital

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Other Unix-related developments:

- *System V was not the only standard promoted for the Unix operating system (Page 4).*
- *Digital Research, Inc. said it will implement its Concurrent DOS operating system on Motorola, Inc.'s VME/10, a 68000-based microcomputer that runs under Unix System V (Page 6).*
- *IBM's announcement of a Unix-based operating system for its Personal Computer was heralded as a powerful endorsement of the multiuser microcomputer and programmer workstation concepts (Page 6).*

System V enhanced

By John Gallant
CW Staff

WASHINGTON, D.C. — AT&T Technologies, Inc. last week announced an enhanced version of Unix System V and three software packages for text processing, application programming and software development. The introductions were made here at the Uniforum International Conference of Unix Users.

Dubbed Release 2, AT&T Technologies' enhanced version of Unix System V will run programs about 5% to 10% faster than the present operating system in a typical program development environment, according to an AT&T spokesman. In addition, the user-to-operating-system interface functions have been improved, resulting in "significant efficiency improvements."

The enhanced Unix also offers greater job control, which will permit the user to shift between processing tasks, the spokesman noted. The release also provides electronic mail capabilities and includes reorganized and expanded documentation.

The first of the three packages announced last week, Documenters' Workbench text processing, allows a user to format text for display and typesetting. It reportedly supports a full range of output devices from printing terminals to typesetting equipment.

The Unix System Basic Language package is said to accommodate programming of simple applications for business and scientific environments. It reportedly includes several debugging features and is compatible with most microcomputer Basic software.

The third package, the Motorola Software Generation System, is for users developing software on Motorola, Inc.'s

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INSIDE

Say good-bye to Burroughs Corp.'s B6900 mid-range processors. Say hello to the A 9, poised to take on the IBM 4361 and 4381. Page 2.

The market for decision support systems has a new participant: Cincom Systems, Inc. Page 2.

Don't expect Trilogy Ltd.'s promised shipments of high-performance IBM-compatible mainframes to be on time. The company is having problems with the prototype semiconductor wafer around which the CPUs will be built. Page 12.

Better late than never? Raytheon Data Systems Co. made a limited entry into the crowded office automation arena last week. Page 12.

Programmers will be the employees most in demand during 1984, and corporate data processing and management information systems directors can expect median salaries of $65,400, Fox-Morris Personnel Consultants, Inc. found in a recent survey. Page 14.

In war-torn Nicaragua, special problems plague DP directors. Page 19.

Americans will be able to mail-order a $499, 32-bit system from Sinclair Research Ltd.'s U.S. operation this fall, the company promised this month. Page 22.

Pieces of architecture are already in place, so integrated services digital networks may soon be more than just a vision. Page 49.

What's Na at Texas Instruments, Inc. is a 32-bit processor. Page 73.

Topping the wish lists of corporate IBM Personal Computer users are faster machines and links with mainframes. Page 81.

Things look like they're looking up for Digital Equipment Corp. After five straight reports of declining earnings, the company will today announce strong quarterly gains. Page 95.

Burroughs replaces B6900

By Patricia Keefe
CW Staff

NEW YORK — Burroughs Corp. last week replaced its B6900 line of mid-range processors with the A 9, a three-model series said to compete with IBM's recently announced 4361 and 4381 processors.

The A series, which Burroughs' Chairman of the Board and Chief Executive Officer W. Michael Blumenthal said will be enhanced to replace the entire B series of processors eventually, represents a departure from the internal architecture used in earlier systems.

The most notable architectural change is the addition of three logical processors to the A 9's CPU. The logical processors allow the system to execute up to three internal operations at one time. They also allow the system to balance up to 10 tasks within the master control program. This gives the A 9 what amounts to a pipelined architecture, noted Leonard M. Bertagnolli, product manager of systems program management for Burroughs' Systems Products Group.

Burroughs A 9

Consists of three models

The A 9 line consists of three models — B, D and F. The low-end A 9 Model B is roughly equivalent to IBM's 4361 processor. The top-of-the-line A 9 Model F is roughly equivalent to the IBM 4381. The Model B is field upgradable to the Model F or to the mid-range Model D processors, Burroughs said.

Each of the A 9 models can be equipped with a minimum of 6M bytes of main memory. The mid-range Model D can accommodate up to 12M bytes of main memory, and the Model F can use a maximum of 24M bytes of main memory, Burroughs said.

The A 9 systems use basically the same software and communications devices used on Burroughs' earlier B5000 and B6000 series processors. These include: Network Control, Message Control, Data Management, Work Management, Report Management, File Management, Text Editing, System Information Management and Network Management (Burroughs Network Architecture); Burroughs said.

According to Bertagnolli, the A 9 can run existing 5000 and 6000 series applications without modification. He added, however, that users may want to recompile 5000 and 6000 series programs eventually to make the most efficient use of the multiple task functionality offered by the logical processors.

Fred R. Meier, vice-president of program management of the Systems Products Group, noted that the A 9 requires half to three-fourths less power, air conditioning and floor space than the B6900. He added that the A 9 can accommodate up to 24M bytes of main memory, four times that of the B6900.

He also pointed out that the A 9 can support a data transfer rate of 6M byte/sec in a burst mode and 4.5M byte/sec in a sustained mode. Meier added that the A 9 offers roughly two times the internal throughput of the B6900 in sustained mode.

The vendor's Master Control Program provides the resource management for all three models of the A 9 family, Burroughs said.

Remote diagnostic capabilities, board-level replacements and customer support centers are also offered with the A 9, the vendor noted.

A basic configuration of the A 9 Model B processor with 6M bytes of main memory costs $351,100. The unit costs $14,831/mo on a five-year lease. The A 9 Model D with 6M bytes of main memory costs $433,900 or $17,973/mo on a five-year lease. The top-of-the-line Model F with 6M bytes of main memory costs $613,900 or $24,982 on a five-year lease plan, Burroughs said.

Burroughs is headquartered at Burroughs Place, Detroit, Mich. 48232.

Tough competitor or appeasement?

By Tom Moshavi
CW Staff

NEW YORK — Burroughs Corp. executives bill the company's newly announced A 9 processor as a new technology replacement for the firm's B6900 line of machines. Two industry analysts contacted last week had a different assessment. They were convinced the new processor was designed more as an appeasement to Burroughs' user base than as a tough competitor of the upper end of IBM's 4300 line.

Burroughs appears to be playing the same basic marketing game as IBM in that it is steering away from adopting a new mainframe architecture strategy in favor of short-term performance enhancements to existing architectures, noted Tom Wilmott, an analyst with the Framingham, Mass., market research firm, International Data Corp.

Pointing out that all mainframe manufacturers will eventually be forced to depart from their current system architectures in order to achieve significant price/performance breakthroughs, Wilmott maintained that one of the best ways Burroughs could gain ground on IBM is to announce a series of processors that are so technologically superior to the IBM line that IBM users would have to take notice. The A 9 does not appear to offer that potential, he said.

Frank Gens, director of information systems research for The Yankee Group, a Boston-based market research firm, agreed with Wilmott's assessment. He added that the A 9 appears to deal with only one of Burroughs' two most pressing problems, that of preserving its current user base. Burroughs, Gens said, must not only preserve its current users, but also start to steal some business away from IBM if it plans to remain a competitor in the mainframe business.

The A 9 announcement appears to be a significant enhancement for current Burroughs users, but it will probably fail to turn the heads of current IBM users, Gens said.

Both Wilmott and Gens agreed that other mainframe vendors, such as NCR Corp. and Sperry Corp., have decided to market systems to specialized market niches rather than repeatedly go head to head with IBM.

"There seems to be a sense that Burroughs is not clear what its next step is going to be," Gens said, adding that a clear indication of what its large systems strategy will be over the next 10 years could significantly boost Burroughs' standing in the mainframe market.

Cincom enters decision support system market

By Paul Gillin
CW Staff

CINCINNATI — Cincom Systems, Inc. last week entered the decision support system market with a set of integrated mainframe-based applications designed around its Mantis fourth-generation language and application development system.

Cincom also announced a micro-mainframe link that provides real-time upload and download facilities between an IBM Personal Computer and a mainframe running Mantis. In addition, the company announced plans to make Mantis available on IBM's Personal Computer XT/370 when that system becomes available late this summer.

The decision support applications, called the Manage User Series, include separate mainframe software for text processing (Mantext), graphics (Mangraf) and a three-dimensional spreadsheet (Mancalc). Written in Mantis, the programs can move data, text and graphics freely between the applications and can call Mantis routines or be called by Mantis programs, a spokesman said.

Mantext performs most standard word processing activities and can combine data from existing files with newly created text, Cincom said. The software is oriented primarily toward creating large, structured documents and developing Mantis applications that require mixing text and data.

Mancalc is a three-dimensional spreadsheet with a maximum size of 999 rows by 999 columns by 999 pages.

Using Mantis, Mancalc can access data stored in Cincom Total and TIS files or IBM DL/1 and Vsam files and load it directly into the spreadsheet. When integrated with Mantis, a Mantis program can call Mancalc to perform a calculation during program execution and return to the program.

Mangraf produces graphics as direct output from an on-line application, Cincom said. It can access any data file in the corporate data base, perform statistical analysis and present the results in predefined graphs. Multiple graphs can be mixed on a screen and may incorporate data from multiple data bases. The product runs under IBM's CICS and requires IBM's Graphic Data Display Manager.

Mantis is a prerequisite for Mangraf and Mancalc. Mantext can be purchased separately. Both Mantext and Mancalc are compatible with Cincom's Environ/1, CICS or CMS operating environments. Mantext licenses for $40,000 in a large IBM DOS environment, $33,000 in a small DOS environment, $50,000 in an IBM OS environment and $60,000 under IBM's IMS/DC. Mangraf licenses for $16,500 and Mancalc licenses for $19,500, the vendor said.

PC Contact allows real-time downloading and uploading between IBM mainframes and IBM Personal Computers using Mantis. The software does not require intermediate files to pass data between the micro and the mainframe.

PC Contact gives the user the ability to perform interactive application development on the Personal Computer by making it appear that Mantis is running locally, the spokesman said.

PC Contact will be available in April at a price of $60,000 for the mainframe version and $1,000 per Personal Computer.

Cincom also said it plans to make a version of Mantis, called Cricket, available on the IBM XT/370 in September. Pricing and detailed technical specifications were not available.

Cincom is located at 2300 Montana Ave., Cincinnati, Ohio 45211.

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68000 microprocessor. The package is said to ease software development by allowing developers to program in either the C language or in assembly language.

The enhanced version of System V is priced at $43,000 for the initial CPU. For a single CPU, the Documenters' Workbench costs $4,000; the Basic System, $5,000; and the Motorola Software Generation System, $7,500. AT&T Technologies can be reached through P.O. Box 25000, Guilford Center, Greensboro, N.C. 27420.

Other announcements

Other major Unix-related announcements made at last week's Uniforum Conference included the following:

■ **Data General Corp.** unveiled a series of enhancements for its UNX/VS operating system, which is integrated with its 32-bit AOS/VS for its Eclipse MV family of minicomputers.

According to DG, the UNX/VS enhancements were derived from AT&T's Unix System V operating system and include features compatible with the University of California at Berkeley's 4.1 Berkeley Software Distribution. The enhancements also include a screen editor, support for a variety of terminals and a C language C-Shell user interface. The system's visual editors reportedly enable users to display a portion of their data as a window into the file so information can be reviewed or changed when necessary.

The enhanced UNX/VS is said to offer a choice of user interfaces, including the Berkeley C-Shell or the AT&T Bourne Shell. DG said it expects shipment of the enhancements in 90 days.

Initial license for UNX/VS will range in price from $9,845 for 16 users to $27,845 for more than 64 users. DG is based at 4400 Computer Drive, Westboro, Mass. 01580.

■ **Oracle Corp.** added Unix System V to the family of operating systems supporting its Oracle relational data base management system (DBMS). In the Unix environment, disk space is allocated to the Oracle DBMS, and within this file system, Oracle allocates its own system tables, data dictionary and user tables. Oracle I/O requests bypass the Unix file system and disk buffer pool to go directly to the disk drivers, the vendor said, guaranteeing transaction integrity within the data base.

The System V version of Oracle operates in multiuser, Unix-based minicomputer and microcomputer systems.

The microcomputer version is priced at $600 for a single user and at $2,000 for up to eight users. For use on a Digital Equipment Corp. VAX-11/730 superminicomputer under the Unix System V, the Oracle DBMS is priced at $24,000, a vendor spokesman said. Oracle is located at 2710 Sand Hill Road, Menlo Park, Calif. 94025.

■ **Absolut Software, Inc.** introduced a line of business software modules for a wide range of processors running under Unix operating systems. As a group, the software packages are said to provide a sophisticated system of order entry, sales reporting, inventory and stock control, back-order and reorder data and billing detail.

The seven modules include manufacturers distribution, wholesale distribution, multistore retail distribution, mail order sales, accounts payable and receivable and a general ledger package.

Priced from $12,000 to $100,000 depending on the user's system and the modules chosen, they run on most 16- and 32-bit microcomputers with at least 20M bytes of hard disk storage, as well as on minicomputers and mainframes capable of operating in the Unix environment.

Absolut Software is based at 2001 Beacon St., Boston, Mass. 02146.

Firms back Isis as Unix standard

WASHINGTON, D.C. — Though it was not obvious from the posture of AT&T and others at the Uniforum Conference here last week, System V is not the only standard being promoted for the Unix operating system.

Four vendors of third-party software for the increasingly popular Unix system held a press conference to announce the formation of a standards consortium "dedicated to the promotion of interchanges of information between Unix applications." The four firms — Access Technology, Inc.; Quadraton, Inc.; Software Express, Inc.; and Unify Corp. — are backing the Independent Software Information Standard (Isis), a new Unix standard that, they said in prepared remarks, provides Unix users with "a superior level of integration, especially in the office automation area."

Representatives of the four vendors said that the consortium will be open to all third-party Unix software producers who agree to maintain compatibility with the standard interface as it evolves.

In a joint statement at the conference, spokesmen from the Isis consortium said they believe Unix's power and portability will make it a major operating system in business environments during the current decade. Jeff Hulton, vice-president of Access Technology, was selected chairman of the group, which also includes Karl Kleesig, president of Quadraton; William Adams, vice-president of marketing for Software Express; and Nico Nierenberg, president of Unify.

UNIX from page 1

Research to implement its Concurrent DOS operating system on Motorola's VME/10 microcomputer.

According to Rowley, the applications library will focus on three areas: software development and programmer productivity tools, commercial application packages and science and engineering applications. Scanlon said the library will initially target Intel Corp.'s 286 and Motorola's 68000 microprocessors.

Scanlon said also that AT&T viewed the applications library as "a critical step in the growth of Unix System V as an industry standard." AT&T began licensing Unix System V last year, and Scanlon said the Digital Research agreement, and possible similar future pacts, will enable the multitasking operating system to operate on "everything but the kitchen sink." Both Digital Research and AT&T will market applications library products, the first of which will be out in the last quarter of 1984.

According to Rowley, the two firms will jointly select "high-quality application packages" developed by independent software vendors and targeted toward System V. He said that AT&T and Digital Research will then "package and merchandise those products in a consistent manner." Rowley said the selection process is currently under way.

"We're convinced that within the desktop marketplace, Unix will be a high-dollar volume player. We expect to take a large chunk of that Unix market," Scanlon said. The AT&T executive also said that the divested giant plans to develop its own packages for inclusion in the library.

Both Rowley and Scanlon said the joint agreement bodes well for independent software vendors, who will soon be able, in Scanlon's words, "to port their Unix System V products across a wide range of hardware." He added that the move opens up the "entire marketplace" to the third-party developers.

Rowley said the merchandising aspects of the deal would be a positive force for development firms that lack "their own marketing strength." Scanlon would not divulge which microcomputers the applications library will operate on, but he said the models to be chosen will be based on the "number of boxes sold, focusing on the high-volume markets."

Neither Rowley nor Scanlon would expand on the specific details of the joint Digital Research and AT&T arrangement or on the procedures through which the selection and marketing of the products will take place. "Our primary focus at this time is microcomputers," Scanlon said. "But we fully intend to utilize the portability of Unix. We intend to make these same applications available across the entire price and performance range."

Scanlon added that the move would greatly increase the commercial value of Unix System V, which AT&T has chosen to support as the industrywide standard for the Bell Laboratories-developed operating system. When asked what effect the recently penned deal would have on the marketability of his firm's existing CP/M operating system, Rowley replied that Digital Research viewed the move as an opportunity to expand into another high-volume operating system environment.

IBM's '83 profits up $1 billion

ARMONK, N.Y. — IBM's 1983 profits jumped by more than $1 billion over 1982's earnings of $4.4 billion, the company reported last week.

Chairman John R. Opel, in releasing preliminary year-end financial results, said the $5.48 billion in earnings could be credited to "trends established in 1982" and the "strength of the IBM product line."

Revenues totaled $40.1 billion, up 16.9% from 1982.

Although the company's income from rentals was down 17%, sales jumped 26.4% and services rose 19.4%.

Per share earnings totaled $9.04 for 606.8 million outstanding shares, compared to $7.39 per share on 596.7 million shares the previous year. Earnings before income taxes were $9.94 billion in 1983, an increase of 24.7%.

For the fourth quarter of 1983, the company earned $1.86 billion or $3.06 per share on revenues of $12.89 billion. The 1982 fourth quarter profits were $1.5 billion on revenues of $11 billion for earnings of $2.50 per share.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (5 issues), April (7 issues), May (5 issues), June (5 issues), July (5 issues), August (5 issues), September (5 issues), October (5 issues), November (5 issues), and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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Digital Research, Motorola ink Unix-centered pact

By John Gallant
CW Staff

WASHINGTON, D.C. — Motorola, Inc. and Digital Research, Inc. announced a joint agreement here last week that calls for Digital Research to implement its Concurrent DOS operating system on Motorola's VME/10 microcomputer. Both companies hailed the agreement as a major move toward standardization of operating system software.

A Motorola spokesman said the move will enable full portability of application software between Unix System V, which already operates on the VME/10, and Digital Research's Concurrent DOS and its CP/M operating systems for 68000 microprocessor-based systems.

Concurrent DOS, which is written in C and is said to be a multitasking system, also provides support for IBM's PC-DOS, allowing application software developed for that system in a high-level language to be ported to the VME/10 as well.

The agreement, announced at the Uniforum International Conference of Unix Users here, also calls for Motorola and Digital Research to develop 19 software packages for the VME/10 under CP/M and Concurrent DOS. Concurrent DOS reportedly also includes windowing capabilities, local-area net and graphics support.

According to the spokesman, seven of the packages to be developed will support the VME/10 Unix System V operating system and will include Digital Research's programming languages.

The Digital Research programming languages reportedly provide application portability from CP/M and Concurrent DOS to Unix System V on the VME/10. The packages, CP/M, Concurrent DOS and a library of languages will be maintained and supported by Digital Research and will be marketed by both it and Motorola. When the development project is completed, it will be possible to transport source code from Concurrent DOS to Unix System V with little or no code conversion required, according to both firms.

During the first quarter of 1984, a number of CP/M products will be introduced, including a Digital Research C package, Pascal MT+ and C Basic compiler. The Concurrent DOS and Unix System V/68 products, which will be available at the end of 1984, will be source-code-compatible with CP/M-68000 languages.

The packages will be priced between $360 and $600 from Digital Research, P.O. Box 579, 160 Central Ave., Pacific Grove, Calif. 93950, and Motorola, P.O. Box 20912, Phoenix, Ariz. 85036.

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IBM crosses AT&T border

By John Gallant
CW Staff

RYE BROOK, N.Y. — IBM made the first foray into a segment of the microcomputer marketplace where it seems certain to lock horns with AT&T when it announced a Unix-based operating system for its Personal Computer and Personal Computer XT [CW, Jan. 16]. The IBM operating system reportedly includes facilities for program development, text processing and operation of a wide variety of existing application programs.

Dubbed the Personal Computer Interactive Executive (PC/IX), the operating system offers a full screen editor in addition to standard Unix system features. Personal Computer users will reportedly be able to process several tasks simultaneously with PC/IX.

PC/IX can reside with other operating systems on fixed disk so that more than one operating system is available to the user. Moreover, it is said to provide programs for file transfer to and from IBM's PC-DOS 2.0 operating system.

Comprehensive program

The Unix-based operating system, developed for IBM by Interactive Systems Corp. of Santa Monica, Calif., is said to be a comprehensive program product featuring a command language that interprets a user's commands for the system; the high-level C language, designed for structured programming; a file monitoring system; word processing; a hierarchical file system for file organization; and program development tools.

According to IBM, PC/IX is a recompiled set of Unix system source statements with a redesign of essential portions of code to improve performance and reliability. The full screen editor reportedly features multiple windows, which display one or more files and permit cursor positioning and window movement on the display screen.

IBM also said that keyboard functions can be used to reduce typing commands and that, by moving the cursor to the appropriate position, text can be moved to different positions within a file or to different files through "cut and paste" operations.

The 19 PC/IX diskettes are grouped into major functions such as basic system programming, communications and text processing, according to IBM.

The system runs on the Personal Computer with fixed disk expansion and the Personal Computer XT. All configurations require at least 256K bytes of memory, one dual-sided diskette drive and one 10M-byte fixed disk drive.

With a one-time license charge of $900, PC/IX is expected to be available beginning in April through IBM's National Accounts and National Marketing divisions. The National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

Signs of Unix support seen coming from IBM

By John Gallant
and Paul Gillin
CW Staff

IBM's announcement of a Unix-based operating system for its Personal Computer was a powerful endorsement of the multiuser microcomputer and programmer workstation concepts. The debut of the Personal Computer Interactive Executive (PC/IX) also signaled IBM's corporate strategy to compete in a Unix world, according to analysts contacted last week by *Computerworld*.

IBM's introduction of PC/IX [CW, Jan. 16], along with the release of the PCjr and the XT/370 late last year, was another step in the industry giant's strategy to blanket the low-end computer market, according to Richard McMahon, president of Acton, Mass.-based AMT Computer Consultants, Inc. "This is also a good forerunner of a larger strategy," McMahon explained. "It could very well be part of an overall game plan to support Unix across the entire line."

"We're all waiting for the other shoe to drop," agreed David Fiedler, editor of "Unique," a newsletter for Unix users. "When IBM says it will support Unix through its entire product line, that will be the really important announcement."

In fact, one observer was puzzled by IBM's decision to release PC/IX before making its anticipated announcement of Unix on a 4300 series superminicomputer. "I was hoping IBM would put its cards on the table and just announce its Unix policy," said Robert Marsh, president of Plexus Computer, Inc. and a director of USR/Group, a Unix users group.

Observers agreed that IBM's PC/IX announcement will bring order to an operating system that until now has lacked a strong vendor endorsement. "The move certainly legitimizes Unix," McMahon said. "It is now available for business applications, where before it was mostly geared to the scientific community. It means there will be wider acceptance of Unix, especially if it is also offered on mainframes and minicomputers in the future."

Fiedler said the PC/IX announcement gained additional importance because it came just before AT&T is expected to introduce its own Unix-based micro. "This will certainly take the wind out of any AT&T announcement," he said.

However, Marsh said the IBM announcement is more of a Big Blue effort to establish a market presence than to throw down the gauntlet in front of AT&T. "There are a whole slew of companies with versions of Unix ready to jump, and IBM is trying to establish position early before there's a lot of momentum in the other direction," he said.

McMahon said PC/IX makes the concept of a programmer workstation "quite a bit more viable."

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NEWS

Apple comes out with 32-bit microcomputer

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Apple Computer, Inc. today radically restructured the high end of its personal computer line with the introduction of a transportable 32-bit micro that reportedly couples Lisa-like technology with a wide selection of personal productivity software packages.

Apple's long-awaited Macintosh machine serves as the entry-level member of a family of 32-bit personal computers that also include three replacements for the company's existing Lisa micro, introduced only about a year ago.

Announced alongside the Macintosh, one day before Apple's Jan. 24 annual security analysts meeting, the three Lisa newcomers include:

- Lisa 2, which supports a microfloppy diskette unit, but no hard disk capability.
- Lisa 2/5, which comes with a 5M-byte external storage module.
- Lisa 2/10, which boasts a built-in 10M-byte disk system.

Built around an 8 MHz Motorola, Inc. 68000 microprocessor, Macintosh is reportedly aimed primarily at computer-illiterate knowledge workers in business offices, schools, scientific settings and homes. Roughly 70% of the products, which Apple hopes to produce and sell in the millions, will find their way into the commercial world, a spokesman for Apple predicted.

Although it will be distributed mainly through retailers, Macintosh will also be sold heavily through Apple's national account executives to Fortune 500 corporations.

Peripherals and software

The debut of Apple's 32-bit micro line coincided with the introduction of a host of Macintosh-compatible peripherals and communications aids, including an external microfloppy diskette system, numeric key pad and Apple Bus, a local networking facility.

Complementing the product family is a raft of previously unavailable software packages for applications such as business graphics, word processing, spreadsheet creation, micro-to-mainframe communications and project scheduling.

All three Lisa additions, as well as their Macintosh sister system, provide the same user interface, run the same software and use the same data interchange medium — an integrated 3½-in. floppy diskette, according to an Apple spokesman.

Apple credits the Lisa 2 machine with loading applications two to three times faster than the original Lisa, which the company has reportedly ceased manufacturing and selling. In addition, the trio costs thousands of dollars less than its year-old predecessor, which incorporated a 5¼-in. diskette unit.

Like all the Lisa models, Macintosh is configured with a mouse, uses icons extensively in its user interface, provides pull-down menus and displays multiple windows simultaneously. The entry-level personal computer also supports a "cut-and-paste" feature that allows data from one display window to be electronically transferred to another, the spokesman said.

Single-tasking product

But unlike Lisa, which can process several applications concurrently, Macintosh is only a single-tasking product. So although it can move data among different windows of the same application, the micro is unable to cut and paste among different applications without forcing users to swap diskettes, the spokesman said.

Macintosh's user programs will come primarily from the more than 100 independent vendors with which Apple is now said to be engaged in software development. Heading the list of outside application suppliers are companies like Lotus Development Corp., Microsoft, Inc. and Software Publishing Corp., the spokesman said.

A few of Macintosh's application packages, however, will originate directly from Apple itself, which will supply programs like Mac Paint, an extensive graphics facility, and Mac Write, a word processing aid.

Apple will also provide a family of software packages that will allow Macintosh to communicate with central host processors. Apple Line, for example, will turn the personal computer into an IBM 3278 look-alike,

See APPLE page 10

Customs sting nets 1,000 Apple II look-alikes

By John Gallant
CW Staff

CUPERTINO, Calif. — U.S. Customs officials said they anticipate criminal indictments will be brought against three alleged importers of counterfeit Apple Computer, Inc. microcomputers, following what investigators termed a private sting operation that recently netted as many as 1,000 Apple II look-alikes.

Armed with search warrants obtained on the basis of information provided by Apple investigators, Customs officers in mid-December raided three California companies and seized between 370 and 420 counterfeit Apple II computers. The raids took place at Super Computer, Inc. in Santa Ana, Extra Computer Corp. in San Francisco and A-Tek, Inc. in Cupertino, according to Customs Special Agent Rollin Klink.

At the same time, Apple authorities obtained a temporary restraining order against Extra Computer, enjoining the firm from selling approximately 645 additional Apple II counterfeits, a spokeswoman said.

Civil action

Jeffrey Blatt, a Beverly Hills, Calif., attorney who has represented Apple in copyright violation cases, said Apple then filed a civil action for a permanent injunction against Extra Computer. Blatt said Extra Computer subsequently agreed to a settlement whereby the firm paid Apple an unnamed sum and handed over components of the systems, including 645 motherboards and 1,400 erasable programmable read-only memories containing pirated Apple programs.

The raids, which were undertaken as part of Customs' Operation Tripwire, may result in the first U.S. criminal prosecution of counterfeit Apple computer importers. Joseph Russoniello, U.S. Attorney for the northern district of California, said his department has not yet decided whether to bring criminal charges against the firms involved. Those criminal charges could include smuggling, conspiracy, piracy and counterfeiting. He said similar charges are also under consideration by acting U.S. Attorney Alex Williams of California's central district.

Blatt said Apple will have to decide whether to file civil copyright infringement suits against the firms if federal authorities decide not to seek indictments. The attorney said Apple has filed some 35 copyright and patent infringement suits worldwide, and eight foreign cases have resulted in criminal prosecutions. Customs authorities estimated that more than 2,000 ersatz Apples were seized in the U.S. alone last year.

The December raids were the result of a private sting operation initiated by the Barrick Security Group, Inc., a San Mateo, Calif.-based investigation firm hired by Apple [CW, Sept. 26]. Barrick President Barry Bergman said the firm maintains data on "hundreds of individuals who deal in counterfeit goods." He said Barrick targeted importers who said they could provide "substantial numbers" of Apple II imitations. Using money provided by Customs officials, Bergman's investigators placed orders for the systems, which were then seized upon delivery.

Investigators would not divulge the manufacturers of the systems, but both Bergman and Klink said the computers, or their components, probably originated in Taiwan. Attorney Blatt said the Apple II computer has become a target for counterfeiters because it is easily built with off-the-shelf components and it enjoys broad software popularity. "We know the system is easily assembled in the Orient," Blatt explained. "Our estimates show that in the Far East phony Apples outsell the real thing by about 10 to one."

Customs officials estimated that each of the counterfeit systems was worth approximately $400. The department, Klink said, is continuing its investigations in conjunction with the U.S. Attorney's office. Blatt said Apple expects a decision on criminal indictments within the month.

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Apple seen betting the farm on Macintosh

By Robert Batt
CW West Coast Bureau

CUPERTINO, Calif. — Apple Computer, Inc.'s new generation of 32-bit personal computers, spearheaded by the long-awaited Macintosh, is seen by company executives and industry pundits alike as the firm's most important product announcement since the Apple II.

Apple has reportedly spent millions of dollars on product development and is expected to pour an additional $50 million into advertising the Macintosh in 1984 alone, prompting many observers to view the next two years as make or break time for the company's young, ambitious management team.

"This is clearly a bet-the-company product strategy, and if it doesn't work, by the time Apple regroups, it will have missed the whole next generation of personal computers and will be in serious trouble," asserted Mike Murphy, partner in a San Francisco-based investment analysis firm, Venture Capital Management, Inc.

For their part, Apple executives make no secret of the critical importance the new products have for the company's long-term viability.

'Current tech not sufficient'

Speaking at a press briefing prior to this week's launching of the Macintosh, a forthright Steve Jobs, chairman of Apple, declared:

"Our whole premise for the Macintosh is based on the fact that current technology is not sufficient to reach the tens of millions of people who need personal computers. If the people in this industry do not require radical technological innovation, then this company will not be here in two years' time."

However, few if any industry observers expect the Macintosh to be anything but an outstanding success.

"This is easily the best price/performance machine ever made. I think it will become the Apple II of the 1990s, and I see a very long life cycle for it, at least five years," said Ken Lim, personal computer industry analyst at the San Jose, Calif.-based market research firm, Dataquest, Inc.

Microsoft, Inc., one of more than 100 independent software vendors supporting the Macintosh, has committed a sizable portion of its new product development to the latest Apple line, and the company expects half of all its application program revenues in 1984 and 1985 to come from sales of Macintosh applications.

"To create a new standard takes something that's not just a little bit different. It takes something that's really new and captures people's imaginations. Macintosh meets that standard," commented Bill Gates, chief executive officer for Microsoft.

Apple's Jobs expressed the hope that what he called Macintosh's leapfrog technology will enable the computer to make huge inroads into small and medium-size businesses as well as the Fortune 500 corporations.

"Since IBM is going to be the service leader in the personal computer industry, we want to be the technology leader, producing low-cost personal computers. Our aim is to remove the need for massive service and support to the end user," he explained.

This is not to say that Apple's strategy for its new product line is without dangers. The most obvious potential pitfall is that the machines are not IBM-compatible. However, this does not seem to worry most industry analysts. A typical appraisal was offered by Greg Kelsey, investment analyst at the San Francisco firm, Hambrecht & Quist.

"There are good cost reasons for not making the Macintosh an IBM-compatible machine. In addition, with the Lisa models [Lisa 2, Lisa 2/5 and Lisa 2/10] having the capability to run both Macintosh software and IBM programs, there is a pretty good argument for saying that Macintosh does not need to be IBM-compatible, given the market it is chasing," he said.

According to Lim of Dataquest, the absence of MS-DOS compatibility is a positive virtue. "It is far too early in the life of the personal computer industry to standardize on one particular operating system. In addition, MS-DOS machines are becoming a dime a dozen, so manufacturing another Personal Computer look-alike is just as dangerous a strategy as putting out a non-MS-DOS device," he said.

Another possible danger is that, as Venture Capital Management's Murphy put it, "people just plain don't like the Macintosh" with its pull-down menus and a form factor that doesn't look like other computers.

Another potential pitfall, Murphy pointed out, is that in an attempt to save up to $50 million a year on inventory costs, Apple is adopting the Japanese method of depending on two weeks of inventory. "Apple is working with suppliers who have never performed such 'just-in-time-delivery' service before. It's a new thing for the U.S. electronics industry, and if it backfires it could cost Apple a lot of money and lost orders," he proclaimed.

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Wafer woes plague Trilogy

CPU delays expected

By Peter Burrill
CW Staff

CUPERTINO, Calif. — Trilogy, Ltd. said last week it had experienced problems with the manufacture of a prototype wafer-scale semiconductor device and as a result will experience a slight delay in the scheduled 1985 shipment of IBM-compatible, large-scale, high-performance computers.

Trilogy released a brief press release last Tuesday indicating that an added metal coating to the prototype wafer produced unsatisfactory results and that a revised procedure is expected to produce a completed wafer prior to the end of March.

Trilogy Vice-President Russell Drew told *Computerworld* the company has identified the problem and expects to complete the revised process "as early as February or as late as March." Drew said the original schedule had planned for completion at the end of this past December.

"It is not a monumental problem by any stretch of the imagination." The firm issued the announcement because it made a public stock offering in the last quarter of 1983 [CW, Sept. 12] and "wanted to alert everyone" about the delay, he said.

The company, founded in 1980 by Amdahl Corp. founder Gene Amdahl, had originally planned to ship its first IBM-compatible supercomputers in the third quarter of 1985, but now believes these shipments will not occur until the fourth quarter of 1985. The new computers are predicted to attain a performance rate of 32 million instructions per second.

The new technology purportedly will see "40 wafers replace 4,000 integrated circuit chips" [CW, Aug. 8]. Sperry Corp. previously invested $42 million to obtain a 15% interest in Trilogy [CW, June 13], and Digital Equipment Corp. invested $20 million for a 9% interest [CW, Aug. 8], with both companies obtaining the rights to use the new technology in future products.

A DEC spokesman said the problem as explained by Trilogy is not unusual in early stages of production. "Delays in new product development are to be expected in this industry," he said. A Sperry spokesman said his company did not wish to comment on Trilogy's announcement.

Drew said the additional metal layer would have completed the wafer module. That module, he said, is said to include the actual wafer configuration, which packs the capacity of 100 integrated circuits onto a 2½-in. wafer and the actual packaging, which encloses the wafer and contains the cooling portion of the module.

APPLE from page 8

while Mac Terminal will enable the machine to emulate teletypewriter-type terminals or Digital Equipment Corp. VT100s or VT52s, the spokesman said.

At Macintosh's heart is one printed-circuit board that contains all the product's digital electronics, including its 32-bit microprocessor, random-access memory (RAM), speech synthesis capability, 1M bit/sec serial port and mouse interface. The same 100-sq-in. board also houses the machine's Apple Bus hardware, which reportedly allows up to 16 Macintoshes, Lisas or other devices — including file servers and laser printers — to be interconnected in a local network.

With Apple Bus, each node in the 230.4K bit/sec network can be situated up to 1,000 ft away from any other hardware module, with a connection cost of $25 per device, the spokesman said.

Digital processing board

In addition to its other components, Macintosh's digital processing board incorporates 64K bytes of read-only memory, the vehicle for implementing all the personal computer's Lisa-like technology.

With its keyboard, 12-in. display screen and integrated 400K-byte microfloppy diskette unit, Macintosh weighs about 20 lb and occupies less than 110 sq in. of desk space, the spokesman said. The system also accommodates a second, optional microfloppy storage module that has to be added externally.

Though currently limited to 128K bytes of RAM, Macintosh will be upgraded to 512K bytes before year's end, when Apple replaces the machine's existing 64K-bit memory chips with 256K-bit components, the spokesman said.

For users of its original Lisa, Apple will furnish an upgrade kit that will allow customers to migrate to any of the machine's three additional models.

An upgrade to the Lisa 2/10 will cost $2,495, while a similar switch to the Lisa 2 or Lisa 2/5 will be free of charge, the source said.

Equipped with a minimum of 512K bytes of main memory and expandable to 1M byte, the Lisa 2, 2/5 and 2/10 cost $3,495, $4,495 and $5,495, respectively. Macintosh, by contrast, retails for $2,495.

Like Apple's existing Imagewriter laser printer, the 400K-byte add-on microfloppy storage unit sells for $495, compared with $129 for the numeric key pad. For the first 100 days after Macintosh's introduction, the Mac Paint and Mac Write software packages will be available at no charge. Thereafter, the programs will retail for $195, the spokesman said.

All four members of Apple's 32-bit personal computer family — as well as most of their hardware and software accessories — are available for sale immediately. First customer shipments of the external 3½-in. microfloppy module will begin March 31 from Apple at 20525 Mariani Ave., Cupertino, Calif. 95014.

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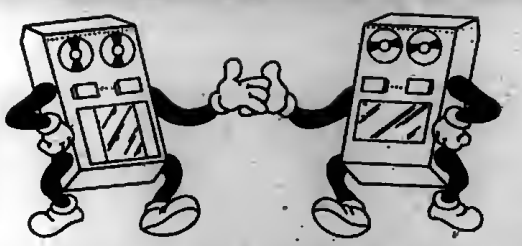

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Raytheon enters OA arena with 16-bit system

By David Myers
CW New York Bureau

NEW YORK — Raytheon Data Systems Co. made a late and limited entry into the crowded office automation arena here last week with a 16-bit Convergent Technologies, Inc. system aimed principally at the airline industry where the Norwood, Mass.-based division of the Raytheon Co. holds 85% of a $100 million installed base.

Although Raytheon Data officials at a press gathering at the World Trade Center disputed the term "value-added OEM," they admitted the RDS Signature 8200 office system unveiled here was almost wholly made by Convergent — except for an airline communications link written by Raytheon engineers and "housings" manufactured by Raytheon Data.

The system, able to host up to eight terminals, runs the Convergent operating system software, rechristened RDOS, for the Raytheon Data product offering.

Jane Ellis, product marketing manager for interactive and distributed data processing systems, said Raytheon Data decided to stick with the Convergent operating system because "it's been on the market for the last two years. It's field-tested and debugged. It won't go through the birthing pains a lot of new operating systems go through. We thought it was important to have a stable operating system."

At the same time, Raytheon Data officials disclosed plans to bring a Unix-driven office system to market later this year, perhaps as early as spring. Jon O. Hooper, senior vice-president for marketing and field operations, said the Convergent-driven system was brought out first in order to get a jump on competitors.

"There have been a lot of announced signings with Convergent, but this is the first system to be brought to market," Hooper claimed. It is also the first complete system to be marketed by the long-time maker of terminals.

"That's where the market is going," Ellis declared. "Customers have these terminals; they want to do something more with them. They look at all this gear and ask, 'How can I marry it all together?' "

A local-area network connection to Xerox Corp.'s Ethernet will be available for the office system by April, according to Ellis.

The office computer, which can also run Digital Research, Inc.'s CP/M 86 and Microsoft, Inc.'s MS-DOS as "concurrent guest operating systems," is aimed at financial institutions and state and federal government agencies as well as airlines, Raytheon Data officials said.

Hooper said his company was not making a late break into office automation because "we already have the customer base in place." In addition to holding 85% of the airline-terminal market, Raytheon Data has installed terminals at 60% of U.S. insurance carriers, Hooper claimed.

The RDS Signature 8200 introduced here last week can operate as a one-terminal computer or as a clustered system with a master terminal and up to seven slaves sharing hard and floppy disks, according to Ellis.

Programming languages available for the system include Cobol, Basic, Fortran, Pascal and assembler. Other program tools include a text file editor, a debugger, a linker/librarian for code segment management and a queue manager for controlling spooled and batch processes.

Available with 15-in. eight-color or 12-in. one-color display monitors, the system is powered by an Intel Corp. iAPX 80186 microprocessor.

Raytheon Data said a typical word processing configuration, with one display terminal hooked up to dual floppy drives and a letter-quality printer, will cost $9,050. A four-terminal data processing cluster, made up of one floppy drive, a 20M-byte hard disk, one letter-quality printer, one high-speed dot matrix printer and one 80-col. dot matrix printer, is listed at $32,502.

Raytheon Data Systems is located at 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Graphics meet set for Feb. 15

SAN FRANCISCO — Printing Industries of America, Inc. (PIA) will sponsor a conference here Feb. 15-17 on "Computer Graphic Networks 1984 to 1990."

The conference will be devoted to integrated systems and services that link graphics and visual media with computer and networking technologies.

Registration deadline for the conference is Jan. 27; fees are $495 for PIA members and $595 for nonmembers.

Information is available from Printing Industries of America, 1730 N. Lynn St., Arlington, Va. 22209.

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Hybrid access channels hot topic

CW AT ICA

By Phil Hirsch
CW Washington Bureau

FORT LAUDERDALE, Fla. — Integration of voice and data and enhancements to popular existing services were clearly on the minds of executives from three regional telephone holding companies who discussed their new offerings with managers of the nation's major corporate communications networks during the annual International Communications Association (ICA) conference here last week.

The speakers devoted much of their attention to discussing hybrid access channels capable of transmitting voice and data simultaneously or alternately over existing analog local loops; integrated access channels for those needing higher bit rates and greater capacity; and enhanced Centrex-CO facilities.

The regional holding companies represented at the meeting were Bell South (comprised of Southern Bell Telephone and South Central Bell Telephone Co.), Nynex (formerly the New York and New England Telephone companies) and the Pacific Telesis Group (formerly Pacific and Nevada Bell Telephone companies). All three plan to offer Local Area Data Transport (LADT) service and Circuit Switched Digital Channels (CSDC) by the end of this year.

Using existing loop

The LADT and CSDC technologies utilize existing analog local loops. In the former case, the loop carries voice in analog form and data at speeds up to 4,800 bit/sec in digital form. In the latter case, the data is transmitted digitally at speeds up to 56K bit/sec alternately with analog voice.

All three regional holding companies, meanwhile, are expanding their fiber-optic circuitry and greatly increasing their ability to provide high bit-rate services and to end. At the ICA seminar, Pacific Telesis Marketing Vice-President A. F. Boechulte indicated two ways his company plans to move present customers to these new offerings: those using private lines for low-speed data transmission are good prospects for LADT, he explained, while those using Dataphone Digital Service will be offered CSDC.

Last week's discussions at ICA made it clear that the divested Bell operating companies are relying on their in-place Centrex-CO equipment to give them an advantage over competitors who market directly to the end user; it also is clear that Centrex is being enhanced as quickly as possible to maximize the advantage.

Pacific Telesis, for example, plans to offer its Cenpac within the next few months.

Cenpac, according to Boechulte, will enable users of the IBM Personal Computer XT and compatible personal computers to order Centrex feature changes on-line.

Nets called vital marketing weapon

By Phil Hirsch
CW Washington Bureau

FORT LAUDERDALE, Fla. — Telecommunications networks are becoming a valuable marketing weapon, consultant Howard Anderson said here last week.

By providing on-line access to specialized data bases, free or reduced-price terminals and similar assistance, Anderson told the International Communications Association (ICA) that banks, insurance companies and firms in several other industries are stealing a march on their competitors. One likely result is that the front office will pay more attention to the telecommunications area — a possibility that could result in a bigger budget for the telecommunications department, he said.

Anderson expects 80% of all managers and high-level executives to be accessible through workstations by the 1990s. However, those devices will undergo major changes, with the personal computer emerging as the most popular type of workstation, he predicted at the ICA meeting.

Telephone carriers and computer companies will be the major suppliers of workstation equipment, according to Anderson. "Telephones soon will be computers, while computers are rapidly evolving into computer telephones."

Northern Telephone Co.'s Displayphone and similar devices are the forerunners of this new terminal, Anderson said. Besides transmitting and receiving voice and text messages, the Displayphone will have local computing ability, compatibility with the IBM 3270 and possibly other DP terminals, touch-sensitive file access, voice as well as text message storage/retrieval capability, an attached printer and other peripherals.

Anderson also predicted that the mainframe processing load will increase rather than diminish because the growing workstation population means more internal and external communications.

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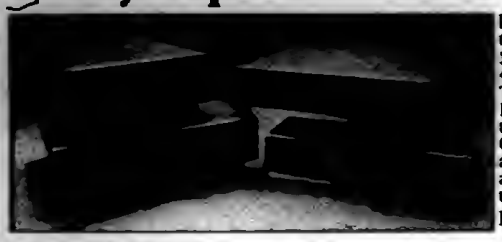

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AT&T offers hints of coming ISDN

FORT LAUDERDALE, Fla. — Possibly the most significant comment at the International Communications Association (ICA) seminar on upcoming carrier offerings came from Dennis White, a services planning manager for AT&T Communications, the company's long-distance services provider.

Describing the integrated access channels that AT&T expects to begin offering shortly, White said they will consist basically of 24-channel, 1.5M bit/sec transmission facilities leased from regional telephone holding companies and resold to users as part of a long-haul circuit capable of transmitting voice, data, video and facsimile signals on an integrated basis.

What the company is planning to offer, in other words, is the first commercial, end-to-end integrated services digital network (ISDN) service.

The service will appeal to only a small group of users — those with a lot of traffic — but it nevertheless will become available, if AT&T's plans materialize, well before any ISDN was generally expected to enter the market and well before similar technology goes into regular service in other countries.

Subdividable 1.5M bit/sec channels capable of carrying voice/data/image signals have been available for some time. What distinguishes the new offering is its ability to reallocate this bandwidth on a dynamic, customer-specified basis.

The 24 subchannels each operate at 64K bit/sec and can be used, according to White, for individual voice and data services (Wats, Message Toll Service, packet-switched and/or circuit-switched data) according to instructions from the user. The instructions reside within the network in an on-line data base that the customer can access directly via one of the 24 channels. If the user's needs change unexpectedly, he can change the instructions immediately.

Integrated access channels will reportedly save the user money because they will enable him to buy bulk transmission facilities costing less per channel than the same facilities procured separately. The savings, White said, could be as high as 40%.

Court upholds Litton award

WASHINGTON, D.C. — The U.S. Supreme Court last week upheld a $276 million award to Litton Systems, Inc. from AT&T, which had sought to overturn an antitrust damages suit won by Litton last February.

The court did not change the 2nd U.S. Circuit Court of Appeals ruling that AT&T excluded Litton from competing in the telephone terminal equipment mart. Litton, based in Beverly Hills, Calif., claimed that it was impeded when AT&T dragged its feet during Federal Communications Commission proceedings.

Senators propose access charge modification

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Resolution of the bitter battle over pending telecommunications legislation became more likely last week when it was learned that a coalition of Republican senators, led by Robert Dole of Kansas, will oppose the legislation if the Federal Communications Commission modifies its pending plan to charge for access to the dial-up telephone network.

Terms of the proposed modification were stated in a letter sent by Dole to Mark Fowler, chairman of the FCC. Dole proposed in his letter that:

- The surcharge that the FCC wants to impose on each residential and single-line business local loop — initially amounting to $2/line per month — be deferred for a year.
- The surcharge be capped at $4/line per month, at least through 1990.
- Smaller independent telephone companies be free to continue collecting all long-distance network access fees from long-distance carriers (in other words, they would not have to be reimbursed partly for surcharges imposed directly on their local-exchange customers).
- The differential between what other common carriers and AT&T Communications (formerly AT&T Long Lines) pay for local access under the FCC plan be adjusted in favor of the other common carriers.

Specialized carriers

Specialized carriers, who insist that the FCC's proposed differential would increase their costs to prohibitive levels, have strongly opposed the FCC plan, along with consumer groups and key members of the U.S. Congress.

Business communications users, along with most telephone carriers, approve the FCC plan.

The House last year passed a bill (H.R. 4102) that permanently bars imposition of surcharges on residential and single-line business users.

The U.S. Senate's companion bill (S. 1660), which is now awaiting a final floor vote, defers these charges for two years.

Support at ICA

Support for the "Dole compromise" was indicated last week in Fort Lauderdale, Fla., at a meeting of the International Communications Association (ICA), a users group of communications managers who work for the nation's largest companies.

Bob Bennis, director of communications for Westinghouse Electric Corp. and chairman of ICA's telecommunications policy committee, said that although the ICA much prefers the access charge plan that is proposed by the FCC, the ICA membership is aware that this is an election year, and any scheme that increases costs for large numbers of voters is unlikely to be popular on Capitol Hill.

AT&T Vice-President Larry Garfinkel, one of the company's chief legislative policymakers, was also present at the ICA meeting.

Garfinkel indicated a willingness to modify AT&T's position, but it was unclear whether the modification would be enough to get AT&T behind the Dole compromise.

According to Garfinkel, AT&T continues to oppose any delay in implementation of the residential/single-line business access surcharge, but it is willing to accept a smaller initial charge and, possibly, a more gradual build-up to the full amount than it had previously indicated.

Business users to gain from break up: AT&T

CW AT ICA

By Phil Hirsch
CW Washington Bureau

FORT LAUDERDALE, Fla. — Deregulation of AT&T's long-distance services will benefit business users as well as the company, AT&T Vice-President Larry Garfinkel said here last week.

Garfinkel asked communications managers from the nation's largest companies to help AT&T sell this idea in Washington, D.C., when he spoke before the International Communications Association (ICA).

Cost-based rates for business users will be one benefit of deregulation, said Garfinkel, who is the new chief services planner for AT&T Communications.

Garfinkel pointed out that under present tariffs, which are based on the separations-settlements process, companies that use interstate long-distance circuits pay more for these services than it costs the carrier to provide them.

The Federal Communications Commission's controversial access charge plan, now scheduled to go into effect next April, is intended to correct this alleged imbalance, Garfinkel indicated, and AT&T is working hard to get the access charge implemented.

However, he suggested that additional rate reductions would be forthcoming from deregulation — discounts for volume purchases of long-distance transmission facilities would be one example. Such discounts are commonplace in competitive industries, Garfinkel said.

More innovative services

More innovative services also would result from deregulation, Garfinkel argued. AT&T would no longer be required to announce its plans in advance to the FCC and, thus, to its competitors; and charges could be based on incremental costs that are much lower than the fully distributed costs now required.

Garfinkel pointed to several services AT&T has proposed in the last several months — audiographic teleconferencing, international videoconferencing, optional calling and new time-of-day pricing plans — that had to be abandoned or drastically changed because of FCC objections.

The FCC is now looking at whether and to what extent deregulation of AT&T Communications is necessary, Garfinkel said. He expects this proceeding to encourage significant relaxation of present restraints, probably on a service-by-service basis, in two to three years.

The FCC proceeding is known officially as Docket 83-1147.

Interested parties have been asked to submit their initial comments to the commission by Feb. 1; reply comments are due March 19.

During a question-and-answer session following his presentation, Garfinkel was asked whether AT&T's existing service to remote areas would suffer if its long-distance offerings were deregulated.

Garfinkel responded by asserting that the company is willing to guarantee "ubiquitous service" at rates pegged to the consumer price index or a similar inflation indicator.

Asked to comment on a major argument against deregulating AT&T Communications — that it presently has at least a 90% market share — Garfinkel responded that AT&T's share is 75% in the "competitive markets" which, he said, are confined to interurban communication among residential customers spending $25 or more per month and business customers spending $60 or more per month on interstate services. Other common carriers have the remainder.

Corporate customers

Garfinkel stressed that a large percentage of AT&T's revenue comes from a small number of corporate customers.

For example, 79% of the company's earnings from interstate business services are contributed by 2% of the customers; only about one half of 1% of those customers contribute nearly 20% of the company's business toll telephone revenue.

His underlying point was that because of this concentration, a deregulated AT&T would not neglect its corporate customers.

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Job-matching firms ride boom

By John Gallant
CW Staff

Touted by developers as the wave of the future in job hunting, most computer-based employment matching services are reaping the benefits of an improving U.S. economy through increased usage and an influx of investment capital.

"The upswing in the economy has had an incredibly positive impact," said Joseph Stacey, president of Bedford, Mass.-based Jobnet, Inc., in a recent interview. "Prospective customers are coming to us with pent-up demand. Now they're looking to hire sooner rather than later. We've seen a phenomenal growth in new customers and in interest in the service."

Jobnet provides employers with a data base of resumes submitted by job-hunting applicants. Among its present customers, Stacey estimated, usage of the data base has increased by several hundred percent.

"The [economic] situation is clearly improving, and our information says that trend will continue for the next couple of years at least," he added. "Our service will also continue to expand because we provide a steady flow of qualified applicants."

Stacey was not alone in his optimism. Base Network Corp. President Fred Robertson, whose firm offers the Contacts computerized recruitment service, said the outlook for the industry is excellent. "Our system usage is easily twice what it was three months ago. Things are really moving. It's like day and night compared to two years ago. We offer employers a chance to contain their hiring costs and reduce their employee search time, and both of those factors are very important today."

The brightening economy has given Chicago-based Contacts an additional boost. Robertson's firm recently concluded a million-dollar funding deal that will provide the capital necessary to expand Contacts' base of operations. "Due to the changing economy," Robertson said, "this has become a more viable option for venture capitalists."

Though it has yet to offer its services to the public, Careersystem, Inc. has also reaped the financial benefits resulting from the mending economy. The Palm Beach, Fla., firm is poised to enter the market for on-line employment services following a three-year data base development and test marketing project and a public stock offering that raised needed investment funds. "The solid response we had from our public offering showed that the interest in our type of service is out there," said President William Berry.

But the industry has had its casualties, too. One of the most promising of the on-line employment services — the Cambridge, Mass.-based Connexions Interactive Recruiting agency — recently suspended operations after less than a year on the market.

According to former President Robert Kvaal, the problem was a "matter of access to capital. The institutional investors just didn't materialize." Kvaal declined to expand further on the difficulties Connexions encountered, but hinted that the firm may resume operations in the future.

Connexions represented the sole sour note in a chorus of optimism sung by industry experts. "We have seen a marked increase in the amount of activity on our system," said Michael O'Connell, co-founder of Computer Search International, Inc.'s Employ on-line data base, which is offered through The Source information service. "The economy has opened up a lot more jobs. People were holding tight to their positions before; they were reluctant to move. But now they're really starting to get up and go."

Programmers top wanted list in '84

PHILADELPHIA — Programmers will be the employees most in demand during 1984, a year in which six out of 10 new jobs will be computer-related in some parts of the U.S., according to a survey by Fox-Morris Personnel Consultants, Inc.

The 10th annual survey of Fox-Morris recruitment and search offices throughout the nation showed that demand for programmers will increase by 18.7% over 1983 levels.

The company also predicted that corporate data processing and management information systems directors can expect median salaries of $65,400 or top salaries of $71,500, placing them eighth from the top in a list of projected salaries for management-level personnel.

On the list of high-demand job titles, electrical and electronics engineers are projected to see 18.5% more openings in their field than in 1983, software/systems engineers 15.1% more, systems analysts 13.8% more and MIS directors 8.9% more.

Fox-Morris President Sanford L. Fox said the proliferation of both business and personal computers will continue to stimulate the demand for data processing professionals at all levels. He said that six of 10 new jobs in the Midwest will be computer-related.

Among workers with two to six years of experience, median and top average salaries are expected to be $33,380 and $39,500 for electrical and electronics engineers; $31,570 and $33,800 for systems analysts; and $29,150 and $31,800 for programmers.

At the entry level, computer science graduates can expect median average salaries of $23,500 and top average earnings of $24,550, the company said. The report is available free from Fox-Morris, 1500 Chestnut St., Philadelphia, Pa. 19102.

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Survey asks: What makes a good DPer?

By James Connolly
CW Staff

PALM BEACH, Fla. — When data processing managers hire data processors, they want the candidates with the greatest work experience, technical know-how and educational background.

But once on board, the "good data processor" should rely more on personality — logic, receptiveness and communication-skills — than on technical ability to advance in a corporation.

Those were some of the conclusions of the "Professional EDP Hiring Study" conducted in November for Robert Half International, Inc., a recruiting firm specializing in data processing and financial personnel, by Burke Marketing Research of Cincinnati. The telephone survey, whose results were released to *Computerworld* last week, polled 50 DP managers and 50 top executives of Fortune 1,000 firms about their DP hiring practices, career growth for DP personnel and the relationship of DP personnel to the rest of their companies.

In listing the traits they look for when hiring experienced personnel, DP managers cited experience 62% of the time. Technical knowledge was mentioned 56% of the time, education 35%, personality 22% and job stability 20%.

Sixty-eight percent of the DP managers said they were responsible for hiring entry-level employees and 74% for experienced workers.

When asked what attributes a "good data processor" exhibits, the DP managers and corporate vice-presidents in 52% of the survey calls cited "personal attributes" such as logic (23%), interaction (15%) and communication (8%). In 46% of the calls, they cited "skills" such as technical expertise (16%), problem solving (10%) and training on equipment (9%).

Ninety-six percent of the 100 managers said DP personnel must communicate well to "get ahead," while "lack of motivation" was cited as the main reason for nonadvancement. Seventy-one percent of those polled said that data processors are "too DP-language-oriented."

'Scared of technology'

Robert Half, president of the recruiting firm, which is headquartered here, said in an interview last week that corporate leaders still tend to be "scared as hell of technology" and that they may be more impressed by a data processor's technical skills. "DP managers, on the other hand, assume the person has the skills. If the employee has had four years of Cobol, he should know Cobol. That may be why they are looking more at personal traits," Half said.

The survey also showed that 52% of the DP managers expect data pro-

See [illegible] page 16

DP managers, VPs part ways on question

PALM BEACH, Fla. — Data processing managers and company vice-presidents don't always agree when they're asked what makes a "good data processor."

The 50 Fortune 1,000 vice-presidents polled in a recent survey conducted for Robert Half International, Inc. here tended to define a "good data processor" according to skills, while data processing managers favored personal attributes such as logic and communications.

Lack of motivation

More data processing managers (40%) than top managers (18%) cited lack of motivation as the reason data processors fail to get ahead in companies, while top managers leaned toward personality deficiencies (30%) as the reason for failure to get ahead in companies.

Top managers felt strongly (48%) that data processing is an excellent field in which women can advance; this belief is held strongly by only 28% of the data processing managers polled.

The top managers also felt strongly (76%) that they and their peers should have a "working knowledge" of data processing procedures. Only 60% of the data processing managers agreed with that suggestion.

Meanwhile, the data processing managers (72%) disagreed more strongly than the top executives (54%) with the suggestion that data processors lack imagination.

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HIRING from page 15

cessing personnel to show more loyalty to their companies in the coming year and that the same percentage as DP departments as traditionally having higher turnover rates than other departments.

Half observed, "Computer people are more conscious of their profession — the hardware and software. Financial people are more conscious of the company. For the DP person to advance, he has to change that outlook, because the company, not the profession, writes the check. Somewhere along the line you have to say, 'This is where I am. I like it here. I'm going to stay.'"

The poll also showed that DP personnel usually are hired through help-wanted ads and recruiters. However, most managers said they have responded, not necessarily in the positive, to unsolicited letters.

Other findings included the following:

- Seventy-five percent of the DP managers polled oppose the licensing of data processors.
- Fifty-eight percent said computer science graduates should have more business or practical experience.
- Only 7% said it is "likely" or "very likely" a head of data processing will become its company's chief executive officer within 10 years.

Those surveyed also were asked what advice they would give to a person entering data processing.

They responded with "communicate" (26%), "learn as much as you can" (16%), "business background" (14%) and "learn technical skills" (12%).

'Allow me to introduce my mother'

PALM BEACH, Fla. — Asked for the most unusual approaches that job applicants pulled out of their sleeves, some of the DP managers recently surveyed for recruiting firm Robert Half International, Inc. cited the predictable "inflated experience or resume."

But other managers, impressed for better or worse, had seen more original attempts to obtain interviews.

They included applicants using a sympathy approach — with crutches and wheelchairs, walking in unannounced and claiming a job, calling the managers at home, claiming to be programmers on the basis of having used a computer and saying they were writing a book on data processing.

One applicant told the interviewer she had won a contest for a free lunch, while another claimed to be more interested in the corporation's welfare than in his own.

Finally, a manager cited the old reliable ploy: An applicant brought his mother on an interview.

DG chief sees revenue growth of 20% to 25%

By Peter Bartolik
CW Staff

BOSTON — Data General Corp. should experience revenue growth of 20% to 25% annually over the next two years, but shortages of components, particularly semiconductors, could affect shipments and costs during 1984, company President Edson de Castro told shareholders at DG's annual meeting here last Tuesday.

Expressing optimism for continued growth in orders as reported for the past two quarters ending in September and December, de Castro said the firm's management team is concerned "about our ability to increase shipments as rapidly as orders come in [during] the months ahead. . . . Shortages of components, especially some types of semiconductors, are beginning to appear. If such shortages become significant, they may affect shipments or costs or both."

De Castro told shareholders that the board of directors intends to elect as a company vice-president Hisashi Tomino, president of DG's Japanese subsidiary, Nippon Data General Corp. He also announced the appointment of a board of scientific advisers comprised of professors from MIT, Stanford University, Carnegie-Mellon University's Robotics Institute and the University of California at Berkeley, including two specializing in robotics and artificial intelligence.

CW photo by P. Bartolik
Edson de Castro

The company did not experience any problems during the quarter ended in December, but "it is a risk that may continue for much of 1984." Expanding later, he said problems are developing industrywide in the supply of random-access and read-only memories, gate arrays and also some components used in mass storage.

While sales and profits increased in the past two quarters, ending a three-year slump that saw annual profits dip from a high of $54.6 million in 1980 to $23.1 million last year, the profit margin for the first quarter ended in September was only 6.2% because of start-up costs for the Desktop Generation microcomputers and added expenses. By the end of 1984, that margin may increase to the low or mid-teens, de Castro said.

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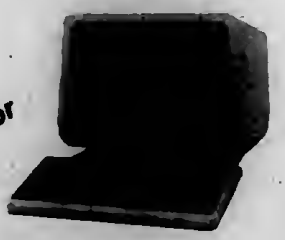

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Comp-U-Card plys high-tech merchandising

Comp-U-Store

By John Gallant
CW Staff

STAMFORD, Conn. — With more than 60,000 items in its data base of brand-name consumer products, Comp-U-Card International, Inc. (CUC) here is bringing the techniques of merchandising into the computer age.

Touted by founder Walter A. Forbes as the leading national electronic merchandising service, CUC offers its more than one million subscribers the opportunity to obtain price and product information from the data base by telephone or through their own home computers. The firm is also carrying the technology a step further by installing in various retail outlets interactive videodisk terminals that enable customers to browse through the customized data base and place orders directly into the system.

CUC carries no inventory; instead, customer orders input into the system are transmitted to the selected vendor's warehouse or outlet to be shipped directly to the customer.

Forbes began building the network of retailers, distributors, wholesalers and manufacturers that offer products through the CUC data base in 1974. The service was originally offered only to telephone subscribers who called a toll-free 800 number to obtain price and product information. In 1979, CUC began Databucks, which Senior Vice-President R. Kirk Shelton said was the first interactive home computer shopping service.

Databucks, which was later to be expanded into the Comp-U-Store service, was initially offered through The Source network. Comp-U-Store is currently available through The Source, Dow Jones and the Compuserve information services and directly to members with a modem-equipped microcomputer.

CUC continues to expand the Comp-U-Store service into what Shelton described as an "electronic mall" by adding an extensive line of pharmaceutical and health care products and specialty items such as the Neiman-Marcus line of gourmet foods.

Until the Databucks service was instituted in 1979, all CUC's product information was maintained through an extensive manual system. The company then installed a Digital Equipment Corp. Decsystem-2060 mainframe with 3G bytes of memory and began the arduous task of building the 60,000-item data base and writing the proprietary operating system and data base management system software that drive the system.

"The initial phase of the project was to design a computer system that would parallel the manual system," Shelton explained. "The process of writing the code took more than two years. It had to be developed one piece at a time, and through each step we would maintain the manual system until we were certain the electronic system was up and running satisfactorily.

"The development process involved a ton of work, but the hardest thing was getting the right suppliers for the system."

CUC currently has a staff of some 30 programmers who maintain the software and data base, a task that Shelton said involves close to 100,000 monthly updates to keep product and price information timely. Aside from the users who access the data base through their own micros, CUC has a staff of some 100 people who operate a bank of microcomputer nodes which remotely access the mainframe from the company's headquarters here. The terminal operators man the telephones for CUC's still rapidly growing Comp-U-Card phone-in retail service.

The CUC system is equipped with a "least cost optimization" feature that chooses the best price among the vendors offering the same product through the system. Thus, vendors have to be price competitive in order to be selected, a situation that often leads to savings of up to 40% for CUC customers, Shelton said.

Comp-U-Mall marks next step in electronic shopping

STAMFORD, Conn. — Comp-U-Card International, Inc.'s (CUC) revenues increased nearly 140% in fiscal 1982 to reach $4.2 million. In the first three quarters of the firm's latest fiscal year, that figure has already grown to more than $5.5 million.

The bulk of CUC's revenues come from the $25 annual membership fee levied on subscribers. In addition, the company earns a percentage of each sale transacted through the network. The Comp-U-Card telephone retail service continues to account for a large portion of CUC's sales, and management expects that sales through Comp-U-Card will double every year for the next three years as a result of the firm's "aggressive direct marketing" techniques.

With Comp-U-Card, subscribers check on price and product information using a toll-free telephone number — (800) 848-7777. Utilizing the system's least-cost optimization feature, a CUC terminal operator provides a customer with the lowest cost listed among vendors for a particular item. The customer can then place an order, which CUC automatically transmits to the vendor's shipping center for fulfillment.

Comp-U-Card does not allow users to browse the data base; they must have a particular product in mind. But that limitation is overcome through Comp-U-Store, another CUC service, which allows customers with microcomputers to access the CUC data base through either an information service or their own modems. After the user enters some broad product characteristics, the system continues to prompt him to obtain more data. The user then receives on his micro a list of products that meet his criteria.

Along with the products, the CUC system chooses the best price among the vendors offering the products. The customer then enters his order directly into the system.

CUC Senior Vice-President R. Kirk Shelton expects use of the Comp-U-Store service to triple each year for the next three years. Comp-U-Store is currently being expanded into the Comp-U-Mall, a concept that will allow microcomputer users to shop from a variety of "stores" housed in an electronic mall.

In addition to the current offerings of 60,000 brand-name products, Comp-U-Mall will offer a discount drug store line, flowers and specialty items from selected catalogs such as Neiman-Marcus. Subscribers will shop in the electronic mall in the same manner as in the Comp-U-Store.

CUC is also making an extensive effort to market its recently announced Video Comp-U-Store. Unlike its other services, the Video Comp-U-Store is a point-of-sale service that makes use of a videodisk terminal to enable customers to browse the CUC offerings or a data base custom-designed for a particular vendor. At kiosks in selected retail stores, customers can call up product information and enter orders, which are transmitted directly to a delivery center.

Video Comp-U-Store is currently being tested in seven department store locations owned by Woodward & Lothrop, Inc. in Washington, D.C., Filene's in Boston and Dillard Department Stores, Inc. in Dallas.

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NEWS

INTERNATIONAL REPORT

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AUSTRALIA

SYDNEY — Apple Computer Australia Pty. Ltd. has appealed Justice Beaumont's rejection of its suit charging Computer Edge Pty. Ltd. with breaching Apple's copyright on Applesoft and Autostart ROM. The appeal against Computer Edge and its managing director, Michael Suss, will be heard again by a full bench next month.

DENMARK

COPENHAGEN — NCR Corp. is continuing its quest to dominate the DP market in Scandinavia. Plans call for the vendor to open an Advanced Technology Center in Oslo, Norway, devoted to seminars and workshops in the application of state-of-the-art technology, Chief Executive Officer Bent Larsen said. Further, terms are being finalized for a joint venture with a leading Norwegian vendor, the Elektriak Bureau, that sources here said will result in a Scandinavian organization larger than IBM.

FINLAND

HELSINKI — Finland's largest computer maker, Nokia, became Scandinavia's second biggest computer company by purchasing 70% of the holdings of the Swedish firm, Luxor. The acquisition was valued at around $30 million. Luxor, the Swedish state-owned electronics company, created the ABC Series of micros, which tops the list of best-selling microcomputers in Sweden.

FRANCE

PARIS — Olivetti and its French subsidiary, Logabax, are expected to introduce a microcomputer compatible with the IBM Personal Computer. The look-alike, jointly developed by Docutel/Olivetti and Logabax in Cupertino, Calif., is said to be a remake of the 1600 system from Eagle Computer, Inc. In France, the product reportedly will be called the LX 1600, handle two 360K-byte diskettes and feature a 10M-byte disk and be available by the summer in order to compete with the IBM Personal Computer and Personal Computer XT, sources said. The entry-level version is expected to cost $3,800.

Meanwhile, Olivetti will unveil the LX 1600 under its own label this quarter. It has been rumored that AT&T has already ordered 130,000 units of this product for its Italian subsidiary.

JAPAN

TOKYO — Japan's Information Industry Committee of the Industrial Structure Council called for legislation to protect software here and to help the growth of the indigenous software industry.

TOKYO — Fujitsu Ltd. has reached a six-year joint development agreement with Texas Instruments, Inc. The agreement allows TI to use Fujitsu's four types of bipolar transistor-to-transistor logic gate array technology and Cmos gate array technology in a variety of large-scale integration circuits.

TOKYO — Mitsubishi Electric Corp. has introduced a 16-bit small business system. Carrying a $12,723 price tag, Mitsubishi's Melcom 80 Model 8 is a low-end machine that runs under the Digital Research, Inc. MP/M 86 operating system and features data/job control, Japanese word processing and graphics.

NORWAY

OSLO — For the second time in its 20-year history, Norway's prestigious Industry Achievement Award went to a computer company when Norsk Data claimed the prize here on Jan. 9. Gisele Rutman, president of the institute that bestows the award, said Norsk was selected for its "stamina and staying power in exporting its product line to markets that are otherwise dominated by the Americans."

OSLO — John Sterns, president of Sterns Europe, met with his future European distributors here on Jan. 14 to discuss support for Sterns' various product lines. Sterns has reportedly introduced a personal computer that is based on Microsoft, Inc.'s MS-DOS operating system. It has a full-page screen option and is said to operate twice as fast as the IBM Personal Computer.

WEST GERMANY

FRANKFURT — Sales of the IBM Personal Computer here have not lived up to the vendor's expectations. Since the product's introduction one year ago, just 7,000 have been installed in the Federal Republic of West Germany, sources said. IBM reportedly plans to remedy this situation by restructuring its product sales and marketing arm here — an announcement that allegedly triggered the resignation of IBM's Frankfurt-based sales and marketing manager, Rosnin Neumeister, on Jan. 1.

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Nicaraguan DP managers face special ills

By Barbara Schaffer
Special to CW

MANAGUA, Nicaragua — "Computerization is not a credential for acquiring privileges, it's a social duty." So reads a slogan on a classroom wall here at the Central Bank of Nicaragua's employee training center. Next to it hangs a Fidel Castro quote: "Sacrifices are fleeting. The only thing that stays with us is the satisfaction of having served the people."

In war-torn Nicaragua, many special problems plague DP directors. Government pressure to fight for the country's Marxist regime, an upside-down economy and a general lack of state-of-the-art technology combine to make Nicaragua one of the world's least desirable places for computer professionals.

An area of major concern for Central Bank's DP Director Eric Brenes is the lack of political commitment among DP people — thus the Marxist signs and slogans. Brenes claimed that "programmers tend to relate more to their computers than to how their work benefits the larger society .... they tend to program without knowing or caring what the purpose of their work is."

Participation in the volunteer militias is unusually low among computer people, a fact that has not escaped notice in government circles, Brenes said. On the other hand, most computer professionals are not prodded into leaving their jobs to become active in Nicaragua's war efforts because their work is of such economic importance. For example, one of Brenes' computer operators was not allowed to volunteer for a coffee-picking brigade because there was no one to replace him at work.

Tough to keep trained staff

Nevertheless, Brenes maintained that holding onto computer operators, programmers and analysts in Nicaragua is one of his biggest problems. The Bank coordinates the activities of the country's seven nationalized banks and financial institutions. These banks would like very much to be able to double or triple their respective staffs (they currently employ about 250 computer professionals), but the country is suffering from an acute shortage of trained computer personnel, Brenes said.

Salaries in the state DP sector are not very attractive, Brenes admitted. Analysts pull in about 8,500 Cordobas a month ($850 at the official rate of exchange, but closer to $85 at the black market rate because American dollars are scarce). While DPers can make more money in Nicaragua's private sector, many experienced analysts and programmers leave the country for more lucrative jobs elsewhere, Brenes noted.

The ongoing shortage of qualified computer people has forced some of the banks to raid other banks' DP departments, tempting the more experienced staffers away with promises of more interesting assignments and slightly higher pay, Brenes said. Most of the banks' programmers are recent college or technical school graduates in their early twenties. Brenes himself is only 29.

Another obstacle Brenes must contend with — shared by both state and private enterprise here — is the lack of foreign reserves and credit needed for buying new equipment. (IBM is presently the only computer vendor operating in Nicaragua.) Brenes reported that the banks are now in the process of replacing their IBM System/34 minicomputers with IBM System/36 machines.

Brenes is also planning to have micros installed in all bank branches to record daily transactions. There are no plans for linking the micros to a central processor, however, because the telephone lines are not adequate to handle the job, he lamented.

Despite his inability to tie the smaller machines together, Brenes thinks microcomputer technology is particularly well-suited for Nicaragua because "it is less vulnerable to economic and political pressure than mainframe technology, especially in terms of maintenance."

Schaffer is a bilingual journalist and technical writer based in Berkeley, Calif., who recently visited Nicaragua. She acted as interpreter during training sessions on structured Cobol at the Central Bank of Nicaragua.

Brenes

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TANDEM

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Sinclair's Quantum Leap

Sinclair micro makes UK debut

By Rex Malik
Special to CW

LONDON — Americans will be able to mail-order a $499, 3-lb, 32-bit system with an 8-bit communications bus from Sinclair Research Ltd.'s U.S. factory this fall, Sir Clive Sinclair, chairman, said at a press conference here to introduce the machine to the UK market.

Slated for delivery to UK users late next month, the Quantum Leap (QL) machine features 128K bytes of random-access memory (RAM) (expandable to 640K bytes) and twin microdrives with 100K bytes each.

The system's communications bus is based on Motorola, Inc.'s 68008 microprocessor, which Sinclair said will soon become an industry standard.

The microcomputer runs on Sinclair's proprietary Qdos operating system and an enhanced version of the company's Basic software called Superbasic. Qdos is said to allow single users to perform concurrent multitasking.

London demonstration

At the London press conference, demonstrations of the machine showed a split CRT screen running six parts of a program each in different windows.

Sinclair claimed the system could handle concurrent processing up to 20 programs.

The 3-lb system also comes with a full-size keyboard and four basic software packages: a word processor, a spreadsheet, a data base management system with relational properties and screen editor and a graphics package.

According to the vendor, the QL can be compared to Apple Computer, Inc.'s Apple IIe, priced five times higher, and IBM's Personal Computer, priced seven times higher.

If Sinclair delivers, sources here believe the QL will redefine the microcomputer industry's price/performance parameters, making it very difficult for anyone else to compete in the short term.

Sinclair gamble

On the other hand, Sinclair is taking a huge gamble: The QL is aimed at the home/professional/educational/business marketplace, while Sinclair had formerly confined its strategies to the low end of this arena.

Moreover, the QL is not compatible with previous Sinclair products, even though the vendor said the local-area network facility will allow Sinclair Spectrums and QLs to be configured on the same network.

Therefore, many industry watchers feel that the QL must be introduced with all the essentials already existing or shortly on the way in order for this product to fly. In keeping with this, Sinclair announced that the following QL peripherals and enhancements are now under development: a 512K-byte memory board extension, a Pascal compiler, a 68000 assembler, a terminal emulator, an analog digital interface, a Winchester disk interface, a modem, a parallel printer interface with multichannel sound generator and a 488 interface.

Malik is a freelance computer journalist based in London.

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TURNAROUND TIME

LARRY E. LONG

Q For seven years I've been with a consulting firm where each promotion is an up-or-out decision. My last two promotions have been on time, and my supervisors have indicated that I'm doing what is necessary to be considered eventually for partnership.

A few recent events have caused me to rethink my career. Two very competent colleagues were denied partnership. This came as a surprise to everybody.

In addition, I've been offered an MIS management position with a client company that offers excellent advancement opportunities.

Given the inconsistency of evaluation criteria at my present firm, would you suggest that I resign and take the position at the client company?

A You're confronted with resolving the age-old question of risk vs. security.

If you enjoy consulting and aspire to partnership and feel comfortable with your progress toward that goal, pursue it.

If you feel ambiguous performance evaluation criteria preclude you from shaping your career destiny with good performance, perhaps you should leave the firm.

Q You came out against the use of logic aptitude tests as a means of determining a person's ability to become a programmer. I disagree.

Based on my experience, I agree that, as you stated, "people who fail the tests may make excellent programmers," but the other statement that "high scorers may never be able to program" is misleading. I have never known a trainee who scored high on an aptitude test who could not perform well in programmer training.

In fact, I feel confident to predict that a candidate who scores well on an aptitude test and has a strong interest in the work will invariably perform satisfactorily as a production/maintenance programmer.

We went through intervals of using or not using aptitude tests, along with normal interviewing and examination of prior work or schooling. The change in the failure rate was well correlated with the use of the aptitude test.

So, a standard programming aptitude test should be used to screen out the unsuitable applicants.

A During the 1960s and, to some extent, the 1970s, DP staffs were created from scratch with available people, most of whom knew little or nothing about computers. With virtually nothing to go on but past performance in an unrelated field, managers turned to aptitude tests as a means of determining an employee's potential to do programming.

This was fine for that era, but today the overwhelming majority of the people being employed in computer-related jobs have some work experience or education in the field. I contend that the proper evaluation of background information is a more effective predictor of success than an aptitude test.

I liken use of aptitude tests for screening to the use of grade point averages in the screening of students for on-campus interviews. Grade point averages do not reflect personality traits, ambition and enthusiasm. Likewise, neither do aptitude tests.

Q I recently received a degree in computer programming from a community college. Now I am attempting to find employment, but am finding three common responses: We are not hiring right now; send us your resume; and we don't hire entry-level people.

The third point, in particular, frustrates me and, I believe, many other would-be programmers. How can you get experience if you can't get a job?

How does a would-be programmer find that first job if he must have X number of years paid experience to work there?

A During the past year, I've received more mail on the issue of the hiring of entry-level people than on any other issue. The mail from MIS managers has been both pro and con, but as you might expect, the mail from professors and students has stressed the quality of the product and the economics of hiring recent graduates.

This may be of little solace to your immediate need, but the feedback I received from recent discussions with about 100 MIS managers is that they are beginning to view the hiring of entry-level people more favorably. Perhaps their change in attitude is a reflection of the change in the economy. Or it may be that MIS managers can't find experienced personnel or they are recognizing the potential contribution of graduates of good programs.

For whatever reason, I look for employers to return to college campuses in the spring with authorizations to fill plenty of entry-level positions.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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ACM seeks papers

NEW YORK — The Association for Computing Machinery (ACM) is calling for papers for its 1984 Annual Conference which will explore the advanced integrated systems and new techniques of the 1990s. The theme of the conference, which will be held Oct. 8-10 at the San Francisco Hilton, is "The Fifth-Generation Challenge."

All papers and proposals for panels must be received by Feb. 15. Notifications of acceptance will be sent to authors by April 30.

Proposals should be sent to Program Chairman, ACM '84, Suite 303, 9900 Main St., Fairfax, Va. 22031.

Managers save data from fire

By James Connolly
CW Staff

HIGHLANDS, Texas — Officials of a local petroleum plant recently dashed across fire lines and into their smoked-filled offices to save computer disk packs and paper records seconds before the office burst into flames.

Sue Franta, data processing manager for Hi-Port Industries, Inc., led the charge when she, two other managers and her husband rescued a dozen 10M-byte disks and armloads of books while a Dec. 5 fire was leveling much of the sprawling petroleum products firm.

"We watched from across the street for about 40 minutes and didn't think the office was going to burn. When we saw the firemen couldn't contain it, we just ran into the building.

"There were no lights, but I knew where the packs were. We started grabbing them and handing them to people," Franta said. "Then the back door burst into flame. It didn't take minutes, just a second or two.

"All I remember after that is hauling it out the door. We were bumping into each other and everything. It must have looked like a Three Stooges movie."

The rescuers saved packs of the company's Data General Corp. CS-40, and, within days, were running their payroll, accounting and other programs on another company's computer in Houston, 25 miles away.

Most Hi-Port records were duplicated off premises, but the data for the two weeks prior to the fire and the data on paper could have been lost in the $20 million blaze. "We did lose some data, but nothing that we can't recoup through our backup," Franta said.

The fire struck at a time when the company was planning to upgrade its system and to develop a disaster plan.

"Let this be a lesson to everyone," Franta said.

Franta said she expected to be without an in-house system for several months as the company rebuilds. The firm resumed production days after the fire.

The blaze, of undetermined origin, was fueled by the oils, antifreeze and cleaning solvents that Hi-Port blends and packages. It leveled the building housing the computer.

"My brother is a volunteer firefighter and saved me a piece of the computer. It just crumbled in my hand," Franta said.

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Sage Faire Set for Reno

RENO, Nev. — Sage Faire '84, a conference on the future of supermicro computer technology sponsored by Sage Computer Technology, will be held Feb. 3-5 at the MGM Grand Hotel in Reno.

The cost of attending Sage Faire '84 is $10, if registration is done by form, or $15 by registering at the fair, the vendor said.

Additional information is available from Marion Kenefick, Burson-Marsteller, Suite 100, 2041 Mission College Blvd., Santa Clara, Calif. 95051.

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1. BUSINESS/INDUSTRY (Circle One)

End Users
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government—State/Federal/Local
95 Public Utility/Communication Systems/Transportation
70 Mining/Construction/Petroleum/Refining
75 Other User _____

Vendors
90 Manufacturer of Computers, Computer-related Systems or Peripherals
85 Computer Service Bureau/Software/Planning/Consulting
80 Computer/Peripheral Dealer/Distributor/Retailer
85 Other Vendor _____

2. OCCUPATION/FUNCTION (Circle One)
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Financial Officer
21 Director/Manager/Supervisor DP/MIS Services
22 Director/Manager of Operations/Planning/Administrative Services
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
36 Data Comm Network/Systems Mgmt
41 Engr/Scientific/R&D/Tech Mgmt
51 Mfg Sales Reps/Sales/Marketing Mgmt
90 Consulting Mgmt
70 Medical/Legal/Accounting Mgmt
80 Educator/Journalist/Librarian/Student
90 Other _____

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as user, vendor or consultant
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

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MANAGERS ON THE MOVE

Angelica Uniform Group of St. Louis has named **KENNETH S. AULL** manager of management information training for the MIS department. Aull will evaluate existing equipment and computer operating system programs for the manufacturer of uniforms in light of current and future processing requirements. He will also plan, guide and coordinate immediate and long-range conversion plans.

Aull holds a bachelor's degree in economics from Iona College in New Rochelle, New York and has over 14 years' experience in his field.

■

Carter Hawley Hale Stores, Inc. in Los Angeles, has announced that **R. VINCENT COSIANT** has been named president and chief executive officer of the Information Services Division; **WILLIAM F. JONES** has been named senior vice-president of development; **ROBERT M. MINAR** has been named senior vice-president of computing and communications; and **JOEL E. MONTGOMERY** has been named vice-president of human resources for information services.

Carter Hawley Hale operates 125 stores through its department store division. The company also operates 37 high-fashion specialty stores through Bergdorf Goodman, Holt Renfrew and Neiman-Marcus.

JOHN ABERNATHY has been appointed director of information and data processing services for Pen-Well Publishing Company's Advanced Technology Group in Littleton, Mass.

Abernathy

Abernathy previously spent eight years with Hewlett-Packard and was responsible for technical support of the business computers at the Andover, Mass., manufacturing division and most recently for programming support of the inventory system at the Chelmsford distribution center.

He has also been systems manager for Travelers Insurance and programmer/analyst with DuPont Chemical.

Abernathy is a graduate of Gettysburg College with a bachelor's degree in mathematics. He received a master's degree in computer science from Rensselaer Polytechnic Institute.

■

RICHARD R. KRIEG has been named vice-president of computer systems development for Associates Bancorp, Inc., a subsidiary of The Associates Corp. Krieg is responsible for the management of application development, office information systems and data resource management.

Krieg joins The Associates with 20 years of experience in financial and systems experience, working most recently for Lincoln National Corp. as vice-president of data processing development.

Previous positions were with Consumer Systems Services Group and MSA, Inc.

■

JOHN W. MERRELL has been appointed an assistant vice-president in the electronic installations department of Metropolitan Life Insurance Co. in New York. Merrell is head of the software and operating systems services unit, which provides the systems software that runs at Metropolitan's several computer centers.

Merrell joined Metropolitan in 1973 as a planning consultant in electronic installations. He became a planning manager three years later, and in 1980, he was appointed a manager. Before joining Metropolitan, he held several positions with the Royal Insurance Co. in New York.

He received his B.A. degree in economics from Richmond College in 1972.

■

TERRY LEE SOCALL has been appointed as director of information services of Visual Services, Inc. in Bloomfield Hills, Mich. Formerly the manager of systems and programming at Detroit Metal Extruding Co., Socall is responsible for computer operations, systems and programming at VSI's corporate headquarters.

Socall earned his associate's degree at the University of Florida, Gainesville and his bachelor's in business management at Wayne State University in Detroit.

Visual Services, Inc. offers integrated merchandising services, such as contests, sweepstakes and coupons; industrial communications, direct marketing, motivation and incentive programs; and telemarketing packages, including rebates.

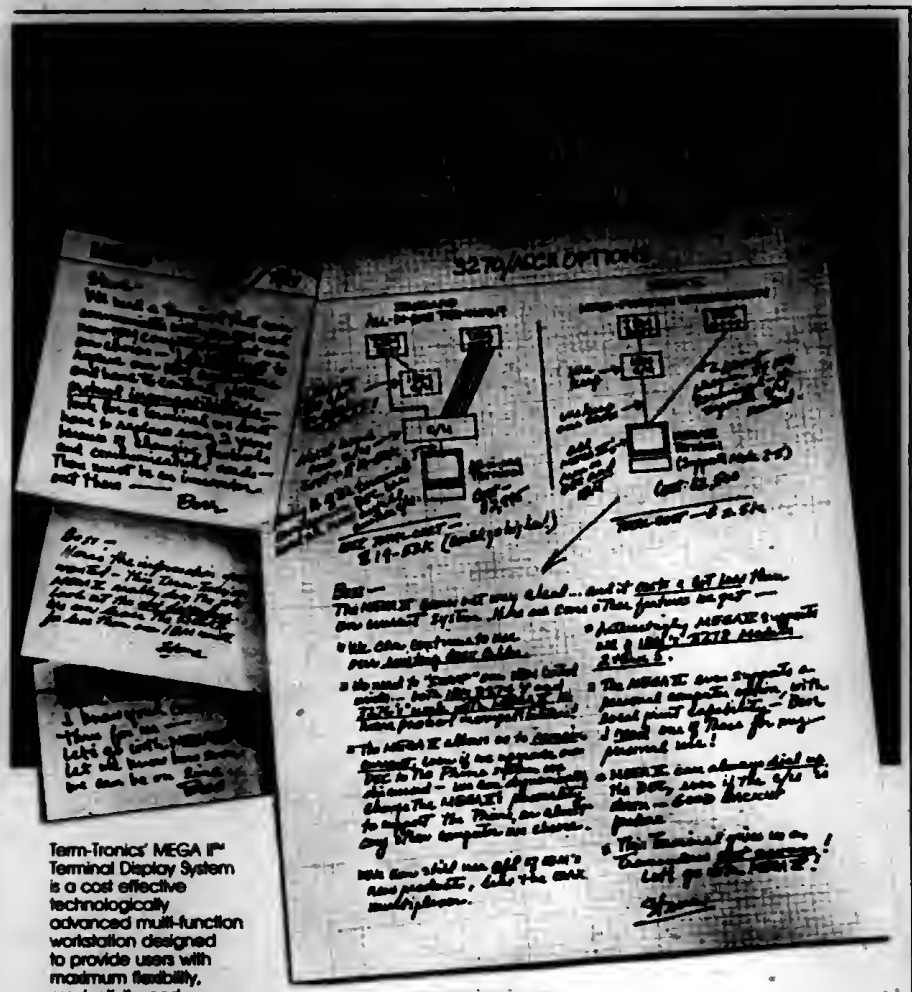
■

NBD Bancorp, Inc. has appointed **JAMES R. BARLETT** as senior vice-president of the Information and Operation Services Division of National Bank of Detroit, the corporation's principal subsidiary. NBD Bancorp is the parent company of 17 banks, as well as trust, mortgage finance, insurance and venture capital subsidiaries.

Barlett is responsible for the general direction of the operations area, such as computer services and trust operations, which provides support for the products and services offered by NBD Bancorp subsidiaries. He remains senior vice-president.

Barlett joined the bank in 1979 after serving as a consultant/partner with Touche Ross and Co. He was named senior vice-president in 1981.

He holds a B.S. degree in industrial management and an MBA from the University of Akron.



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Videotex eyed as traffic stopper

By Paul Korzeniowski
CW Staff

HONOLULU — Instead of building a highway or a public rail system to alleviate traffic congestion, city and state officials here are considering a videotex system.

Honolulu traffic is so congested that $20 million was spent by the Hawaii Department of Transportation to study possible solutions to the problem. City officials are considering rationing automobile travel and implementing road pricing, which would charge people for using certain roads, to alleviate congestion.

But "there is a limit to what rerouting and traffic control accomplish," said Carl Takamura, an aide to Hawaii's governor, George Ariyoshi. "What Honolulu needs is a revolutionary method to ease congestion."

One method, proposed by Aegis Systems Corp. in Tigard, Ore., is the purchase of a personal computer for every Honolulu home, business and office, along with the development of Autoride, an on-line transportation application. "Autoride will be a 24-hour, on-line system matching riders and drivers, arranging special transportation for elderly or handicapped people and possessing security features," explained Malcolm McLeod, a Department of Transportation economist.

The system so sparked the interest of Gov. Ariyoshi that he has scheduled a governor's conference for Jan. 31-Feb. 1 so opponents and proponents of the system can debate its merits. "There is at least a 50% chance that the system will be implemented," McLeod said.

Aegis estimated that $200 million would be required to implement the system. "It requires 320,000 personal computers, one or two mainframes and communications equipment," noted Robert Benke, president of Aegis.

But the price is less than that of comparable rail and bus system solutions. "Autoride's implementation cost is less than 20% of the cost for building a highway or transit system," Benke said. The cost of proposed public rail transportation system for Honolulu is estimated at $1 billion.

Autoride would match riders to taxis or private automobiles traveling to nearby areas.

"The system will use a more intelligent card than a magnetic-strip reader," Benke claimed. "The card would have a microprocessor. When a person enters a password, it will be written on the card rather than on a central data file."

In the proposed system, riders enter pickup points, destinations and times when rides are needed. Drivers enter routes, destinations, times of departures and vehicle registrations. Drivers may be either professional taxi drivers or residents.

A mainframe would check driver registration to ensure that the driver has no criminal record and that the car is insured, then match riders to drivers. "The key is providing door-to-door service," Benke said.

Drivers and riders will not exchange money. "The system would be cashless," Benke noted. "At the end of the month, riders would be billed and drivers would be paid."

Drivers will either be paid cash or receive credit slips for gasoline. Credit slips will be used if Honolulu implements gasoline rationing as a means of curbing congestion.

Number of Automobiles on Oahu	
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HP's IUG meet to address varied DP topics on Feb. 26

ANAHEIM, Calif. — A wide range of topics — data communications to application design — will be featured at the Hewlett-Packard Co. International Users Group (IUG) annual conference Feb. 26 to March 2 here at the Disneyland Hotel.

Hosting the event for IUG, a nonprofit association of HP computer users, will be the Southern Regional Users Group, a 700-member affiliate of the IUG. Delegates from HP will present lectures on HP software, support and future strategy. Software contributions will be distributed in the form of a swap tape.

More than 120 exhibits of HP 3000-related products will be featured at a vendor show.

About 1,800 participants are expected. The conference registration fee is $400.

Conference Manager, HP 3000 IUG, 2570 W. El Camino, Mountain View, Calif. 94040.

HP users groups to merge

MOUNTAIN VIEW, Calif. — By a nine-to-one margin, the 5,000-member Hewlett-Packard Co. HP 1000 International Users Group and the 2,000-member Hewlett-Packard HP 3000 International Users Group voted to consolidate their boards of directors.

Approximately 3,200 members voted before the Dec. 14 deadline. The officer staffs and many of the administrative functions for the two users groups have been merged for 2½ years.

"With the support of the members, the users group can now swing the doors open to users of other HP models, such as the HP 150," according to Bill Crow, association manager for both groups.

More effective united

"HP computer users benefit from a unified users group. The more comprehensive we are, the more effective we are as an influential voice to HP and a resource for members," Crow said.

Membership in either group is priced at $400 for an institution, which includes a set of public-domain software, or $50 for an individual.

International Users Group, Inc., 2570 El Camino Real W., Mountain View, Calif. 94040.

Pick Spectrum set for Reno Feb. 22-24

RENO, Nev. — Pick Spectrum '84, sponsored by the International Data Base Management Association (IDBMA), will be held Feb. 22-24 at the MGM Grand Hotel here and will focus on computer education for the business professional. The conference is geared toward the Pick & Associates, Inc. Pick operating system.

Highlights of the computer conference include a series of sessions for business professionals, beginning with what a computer is and ending with an understanding of a total computer solution.

Among the 14 education sessions are ones concerning the difference between hardware, software and firmware; the definition of application software; word processing; computer communications; videotex; peripherals; and how to shop for a total computer solution.

Fifty exhibitors are contributing to the education sessions.

The full conference registration cost is $300. One-day registration costs $100, and the cost of attending the exhibits is $15, according to IDBMA.

IDBMA, Suite 210, 9470 Appaloosa Road, San Diego, Calif. 92131.

SIM extends paper deadline

WASHINGTON, D.C. — The Society for Information Management (SIM) has extended until Feb. 15 the deadline for paper submissions to its 1984 Society Awards Competition.

Papers must describe an MIS, an approach to developing information systems or a technique for improving or managing an MIS activity. They should also deal with completed systems, be less than 1,000 words and include a short description of the system.

The first-place winner will receive $5,000, and the paper will be printed in *MIS Quarterly*, published by the University of Minnesota. Awards of $3,000 will be made to runners-up; all finalists' papers will be reviewed for publication in *MIS Quarterly*.

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Ergonomics seen key to better productivity

By Lynn Haber
CW Staff

Office automation and the new information technologies are today's lifelines to business productivity, profit and survival. But it's not enough just to put a personal computer or a terminal on a desk.

Mechanical engineering must go hand-in-hand with human engineering — ergonomics — if the automated office is to be effective, office designers and consultants told *Computerworld* recently.

From a public health and safety perspective, as many as 12 states are considering legislating ergonomic requirements for all work places that use modern technological devices such as CRT terminals.

According to Carl Ross, a spokesman for Herman Miller, Inc., a New York-based manufacturer of office furniture and leader in the development of ergonomic furniture, there are studies that strongly suggest "with improved ergonomic workstations, there is increased worker productivity."

And Jeffery Simon, partner and senior vice-president in charge of technical services for SCR Design Organization, Inc., also of New York, noted that a major thrust at the recent International Facilities Managers Association conference in Denver was that companies are becoming much more aware of people and recognizing that people are their greatest resource. "When you look at the amount of money you spend yearly on facilities and equipment, etc., it still revolves around the person and quite often the person's salary," Simon noted. "Companies realize that absenteeism and productivity are going to make or break a business. They are tuning in on the worker — and ergonomics is one way of doing this."

"The central problem confronting all organizations is that existing facilities are built to mature standards — many 30 years old or more — that effectively support a mature, paper-based work process," according to a report, titled "Office Automation and the Work Place Standards in the '80s," written by Jon B. Ryburg, senior associate for the Facility Management Institute, a division of Herman Miller Research Corp. in Ann Arbor, Mich. "Everything in today's corporate environment, including furniture, lighting, windows, space standards and building utility systems, is geared to whatever technology and/or activities are ultimate

See OA page 30

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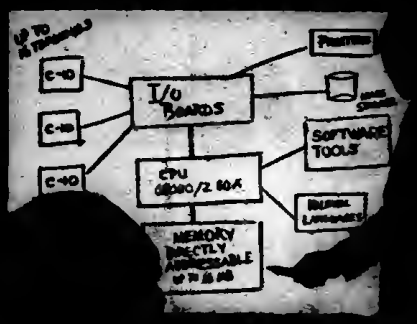

Ohio VDT bill called typical of state efforts

Legislation that attempts to regulate the use of video display terminals in the office environment is being prepared in many states across the country. Typical of this type of legislation, according to Janice Blood, a Boston spokeswoman for 9 to 5, an organization for working women, is Ohio's House bill 552, authored by Rep. Barbara Pringle.

The stated purpose of the bill is to require minimum occupational health and safety standards for operation of VDTs in places of employment. The bill specifies certain equipment requirements: that the terminals be placed on adjustable chairs and tables; that they be equipped with tilt screens or be placed on movable platforms and have detachable keyboards; that they be equipped with individual brightness and contrast controls; and that they come with noise reduction covers, have metal shielding on the transformer of the VDT to block radiation and be in an area where there is indirect lighting.

There is also a provision mandating rest breaks for workers and setting maximum exposure limits, a provision that employers give free eye exams at least once a year and a pregnancy consideration clause requiring employers to offer alternative duties at the same work site to pregnant VDT operators. The bill also

See BILL page 30

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OA from page 29

ly required to do paperwork."

The report noted that "the new technology of office automation is based on a new way of working. Slowly at first, but gradually, it involves more and more the use of computer support via terminals (and other devices) until the work activity has changed dramatically and the facility environmental support requirements are different."

Some of the factors for the basic automated office which should be considered for a safe and productive ergonomic environment include floor space, lighting, electrical service, room temperature, noise level, floor coverings and furniture requirements, such as desks, chairs and file cabinets.

Simon, an architect with SCR, a company which for its 5½ years in the business has specialized in corporate office interiors, observed that "quite often what we've seen in touring numerous office facilities is that people will have the CRTs on file cabinets next to them, with their knees pressed up against the side of the cabinet to get close and their backs arching away from the back of the seat. It shows that with the advent of automation in the office, the furniture which is generally existing or even if it is new, may not be properly designed for use with that equipment."

Broader approach

While the technology industry flourishes with more varied equipment offered by a greater number of vendors, standards for the industry remain in a state of flux. And according to Ryburg's report, "if mis-matches are to be corrected, a broader approach to new facility standards to support office automation is required."

A solution to the need for a new facility standard to support office automation in the 1980s must, the report stated, "include both comfort and productivity, or it will not be effective. And to be effective, the performance requirements for facilities must include the integration of people, process and place factors, not just one or two."

From a design perspective, one of the things Simon sees being stressed in interiors is flexibility, "so that the furniture you buy, the space you build, you're not painting yourself into a corner. You want the space and the furniture to be able to change to meet the needs of the equipment which may be coming in a year or that's not even known right now.

"There's so much talk about ergonomics going on today that most of the corporations know or have a sense of the importance of the situation," Simon said. "When we do an analysis of a setting, we bring the company up to speed if we see that they're really thinking in the dark ages — and we're going through this with a number of our clients."

Construction cost

In terms of cost, according to Simon, a fairly automated office should be planning $35 to $40 per square foot for construction costs, with some of that cost, potentially as much as $15 to $20, supplemented by the landlord.

In terms of furniture, filling in pieces including chairs and files, another $10 is often budgeted.

"I think that by giving people a good environment, one that is going to make their day, since people spend a large portion of their day at their place of work, you're in essence giving them a nice environment that makes their work easier, their attitudes better and their image for the company and respect for the company enhanced," Simon concluded.

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BILL from page 29

calls for semiannual inspections of the equipment and open documentation, making available the inspection records for review by VDT operators and/or their representatives.

The bill asks for penalties to be imposed on an employer for violations of the provisions amounting to $1,000 per day of violation.

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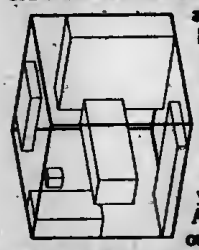

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CALENDAR

WEEK OF FEB. 5

FEBRUARY 7-10, SEATTLE — Structured Systems Design. Contact: Georgianna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

FEBRUARY 7-10, BOSTON — Data Communications. Contact: Ruth Dardick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45404, Los Angeles, Calif. 90045.

FEBRUARY 7-10, SAN DIEGO — CAD/CAM Systems. Contact: Ruth Dardick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45404, Los Angeles, Calif. 90045.

FEBRUARY 7-10, WASHINGTON, D.C. — Microprocessor Software, Hardware and Interfacing. Contact: Ruth Dardick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45404, Los Angeles, Calif. 90045.

FEBRUARY 7-10, WASHINGTON, D.C. — Programming in C: A Hands-On Workshop. Contact: Ruth Dardick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45404, Los Angeles, Calif. 90045.

FEBRUARY 7-10, SAN DIEGO — Software Project Management. Contact: Integrated Computer Systems, 3304 Pico Blvd., Santa Monica, Calif. 90405.

FEBRUARY 8, WALTHAM, MASS. — DP/User Interface. Contact: Chris Riepel, Conifer Computer Services, 370 Main St., Worcester, Mass. 01608.

FEBRUARY 8-9, CARY, N.C. — SAS Color Graphics Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

FEBRUARY 8-10, BOSTON — Advanced Office Automation for the 1980s. Contact: Software Institute of America, 330 Salem St., Wakefield, Mass. 01880.

FEBRUARY 8-10, NEW YORK — SAS Basics Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

FEBRUARY 8-10, AUSTIN, TEXAS — Performance Engineering of Software Systems. Contact: Information Research Associates, 911 W. 29th St., Austin, Texas 78705.

FEBRUARY 8-10, SAN FRANCISCO — Local-Area Networks. Contact: Systems Technology Forum, Inc., 9000 Fern Park Drive, Burke, Va. 22015. Also being held Feb. 29-March 2 in Washington, D.C.

FEBRUARY 9, NEW YORK — PC-DOS 2.0. Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 7th Ave., New York, N.Y. 10123.

FEBRUARY 9, NEW YORK — Personal Computer Communications. Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 7th Ave., New York, N.Y. 10123.

FEBRUARY 9-10, BOSTON — Troubleshooting the Data Communications Networks. Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Feb. 16-17 in Seattle and Feb. 23-24 in Pittsburgh.

WEEK OF FEB. 12

FEBRUARY 13-14, DEERFIELD BEACH, FLA. — Outlook for Computer Printers. Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

FEBRUARY 12-15, BALTIMORE — Prime Users Group East, 1984 Conference. Contact: Ray Grande, Prime Users Group, P.O. Box 138, South Attleboro, Mass. 02703.

FEBRUARY 13-14, BOSTON — Operating Systems for Personal Computers. Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Feb. 23-24 in Chicago and Feb. 27-28 in Los Angeles.

FEBRUARY 13-14, BOSTON — Supporting and Maintaining the Data Communications Networks. Contact: Data-Tech Institute, 286 Franklin Ave., P.O. Box 509, Nutley, N.J. 07110.

FEBRUARY 13-15, WASHINGTON, D.C. — Personal Computers in Business and Government. Contact: National Institute for Management Research, Department PR, P.O. Box 3727, Santa Monica, Calif. 90403.

FEBRUARY 13-15, CHICAGO — Microcomputer Data Base Management Systems. Contact: Software Institute of America, 330 Salem St., Wakefield, Mass. 01880. Also being held Feb. 27-29 in Atlanta.

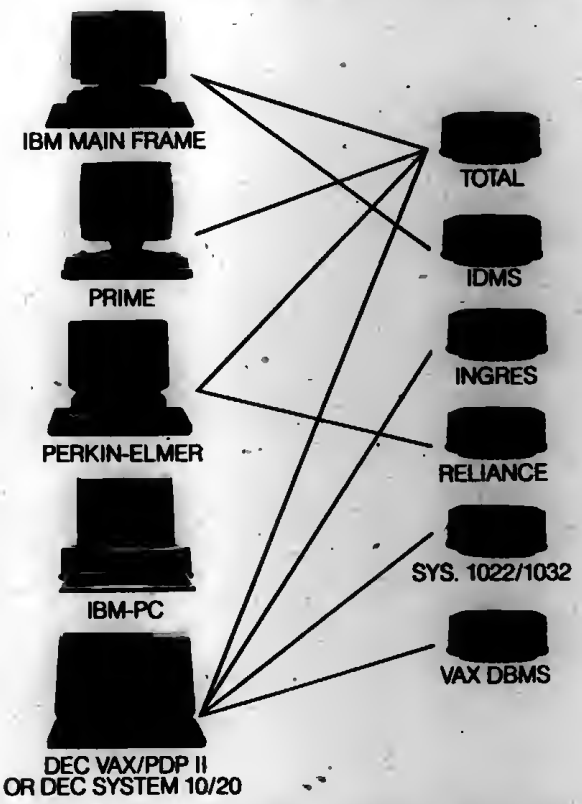
FEBRUARY 13-15, NASHUA, N.H. — Structured Testing. Contact: New Hampshire College Resource Center, New Hampshire College, 2500 N. River Road, Manchester, N.H. 03104.

FEBRUARY 13-15, BOSTON — Purchasing Management and the Computer. Contact: American Management Associations, P.O. Box 319, Saranac Lake, N.Y. 12983.

FEBRUARY 13-15, SARASOTA, FLA. — Office Automation. Contact: Management Information Systems, National Easter Seals Society, 2023 W. Ogden Ave., Chicago, Ill. 60612.

FEBRUARY 13-15, SAN FRANCISCO — Structured Design. Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

FEBRUARY 13-15, PORTLAND, MAINE — Systems Project Management. Contact: Association for Systems Management, 24587 Bagley



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Road, Cleveland, Ohio 44136.

FEBRUARY 13-15, LOS ANGELES — Auditing and Security Concepts for IBM's MVS Operating System. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 13-15, LOS ANGELES — Facilities for Auditing Within IBM's OS/VS Operating Systems. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 13-15, LOS ANGELES — Audit and Control of CICS. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 13-15, PARSIPPANY, N.J. — MVS Dump Debugging. Contact: Chubb Institute, 8 Sylvan Way, P.O. Box 342, Parsippany, N.J. 07054.

FEBRUARY 13-16, WASHINGTON, D.C. — CICS/VS Application Design. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

FEBRUARY 13-16, FORT LEE, N.J. — CICS/VS Logic and Debugging. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Feb. 13-16 in Washington, D.C.

FEBRUARY 13-16, LOS ANGELES — Vtam: From Start to Finish. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

FEBRUARY 13-16, PHILADELPHIA — C Programming Workshop. Contact: Plum Hall, 1 Spruce Ave., Cardiff, N.J. 08232.

FEBRUARY 13-17, ORLANDO, FLA. — Vtam Programming. Contact: Harris Education Center, 6230 S. Orange Blossom Trail, Orlando, Fla. 32809.

FEBRUARY 13-17, DETROIT — Structured Analysis and Design Workshop. Contact: J. Baldwin, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

FEBRUARY 13-17, WASHINGTON, D.C. — Work Load Analysis and Forecasting. Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

FEBRUARY 13-17, TRUMBULL, CONN.— C Programming. Contact: Gregory Geiger, Sumner Rizzo Information Systems, Trumbull Industrial Park, 36 Nutmeg Drive, Trumbull, Conn. 06609.

FEBRUARY 13-17, BOSTON — Structured Analysis and Systems Specification Workshop. Contact: J. Baldwin, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Feb. 13-17 in Cleveland, Long Beach, Calif., and Melville, N.Y.

FEBRUARY 13-17, NEW YORK — CICS/VS Application Programming. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

FEBRUARY 13-17, OAKBROOK, CALIF. — Effective Data Base Design. Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

FEBRUARY 13-17, DENVER — Structured Analysis for Real-Time Systems. Contact; J. Baldwin, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Feb. 13-17 in Palo Alto, Calif.

FEBRUARY 13-17, HOUSTON — CICS/VS Internals. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

FEBRUARY 13-17, MINNEAPOLIS — Structured Analysis and Design. Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

FEBRUARY 13-17, ATLANTA — The Data Structured Systems Development Methodology. Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

FEBRUARY 13-17, CHICAGO — Information Modeling Workshop. Contact: J. Baldwin, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Feb. 13-17 in Philadelphia.

FEBRUARY 13-17, CHICAGO — Project Planning and Control Workshop. Contact: J. Baldwin, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

FEBRUARY 14, NEW YORK — Introduction to Lotus 1-2-3. Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 7th Ave., New York, N.Y. 10123.

FEBRUARY 14, NEW YORK — CICS/VS Concepts and Facilities. Contact: Tultech, 39 Broadway, New York, N.Y. 10006.

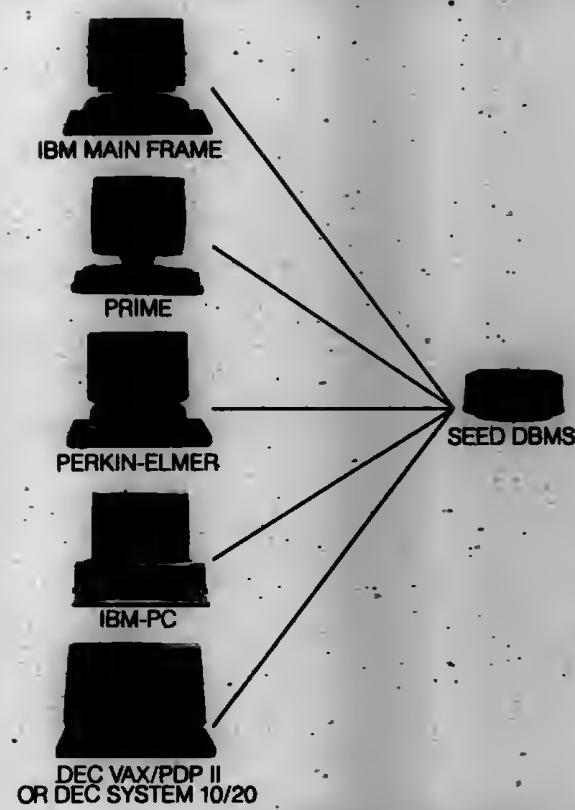
FEBRUARY 14-15, WHITE PLAINS, N.Y. — Frost and Sullivan's First Annual Automated Manufacturing Systems Conference: A Market Assessment. Contact: Carol Sapchin, Frost and Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

FEBRUARY 14-16, PHILADELPHIA — 1984 Association for Computer Machinery (ACM) Computer Science Conference. Contact: ACM, 11 W. 42nd St., New York, N.Y. 10036.

FEBRUARY 14-16, CARY, N.C. — SAS Basics Portable Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

FEBRUARY 14-17, CHICAGO — Vtam for Systems Programmers. Contact: Software Information Services, P.O. Box 4132, Bellevue, Wash. 98009.

FEBRUARY 14-17, ANAHEIM, CALIF. — Data Base Management Systems: Mini, Micro and Distributed Applications. Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Feb. 28-March 2 in Baltimore.



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EDITORIAL

We need both

When daily newspapers started reporting last summer that computer hackers' footprints were showing up with increasing regularity in private data bases around the country, it didn't surprise anyone in the computer industry; unauthorized access has been a problem for years. Most of our lawmakers, however, were thrown into a tizzy. Many respond to the term "computer" with glazed eyes; throw in the term "hacker" and you can see them wondering how taxi drivers got involved in high-technology crime.

In short, the U.S. Congress is not prepared to consider issues relating to the introduction of high technology, issues that are fast taking center stage in public debate. Besides computer crime, these issues include VDT safety, privacy, copyrights and patents, manpower development, worker retraining and scientific education.

Congress' Office of Technology Assessment does good work on many of these issues, but the OTA is too reliant on the wishes of Congress for its work agenda and too deliberate to produce reports in a hurry. Militantly nonpartisan, the OTA never recommends courses of action and, in its efforts to represent all sides of a debate, too often produces only tepid, middle-of-the-road overviews of important, controversial issues. Its work is valuable, but it isn't enough.

Congress needs help, and it needs it right away. The proposal by the Association of Data Processing Service Organizations, Inc. that Congress set up a blue-ribbon panel of industry, academia and government representatives to study high-technology issues and their impact on society [CW, Jan. 16] is a good idea. A panel commissioned by Congress to report back in a short time with recommendations on these kinds of issues could be instrumental in shaping the information era in this country.

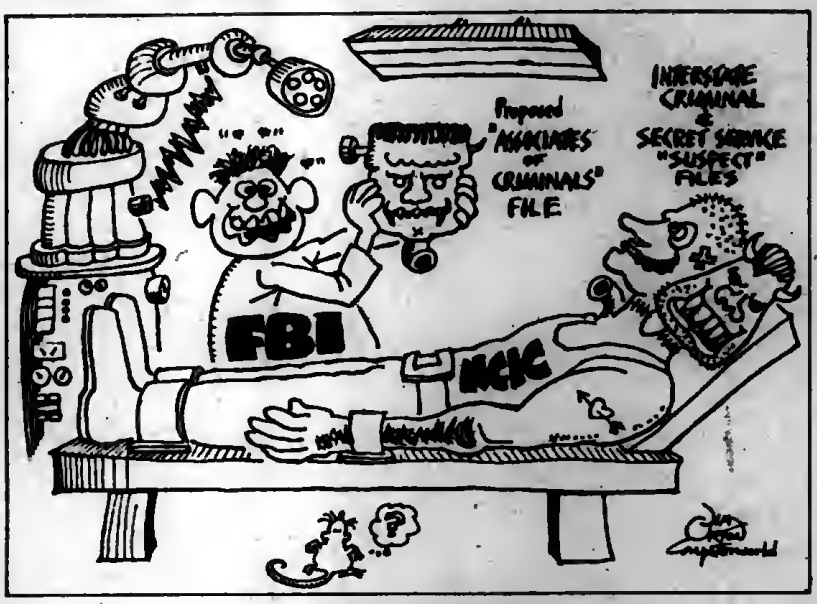
Of course, many in the computer industry will disagree with the findings and recommendations of this panel. There is nothing strange about that, and it does not invalidate the need for a rational approach to high-technology issues. Congress is going to consider these issues and pass laws on them no matter what. It is important that it have a firm, considered base of information when it does.

At first glance, it would seem the Information Age Institute planned by the Computer and Business Equipment Manufacturers Association may needlessly duplicate the work of the panel recommended by Adapso. But the two efforts are actually very complementary.

No one has a greater stake in the development of these issues than the information industry and its users. Various segments of these groups have begun lobbying Congress with their points of view. If they can formulate a unified approach to any of these issues, it will make whatever congressional action is needed that much easier and sensible.

If the Adapso- and Cbema-recommended panels differ on issues, it makes sense to have the opposing viewpoints quickly brought to light and clearly defined. And if the private sector and government-supported organization should happen to agree on approaches to various issues, the consensus will be overwhelmingly persuasive in whatever legislative action may be needed in the future.

The information era is hard upon us and will arrive with or without a rational, problem-solving effort, with or without congressional awareness and participation. The spread of high technology is a major societal development; things will go a lot more smoothly if all those affected, especially Congress, do some advance planning for it.



'Eat your heart out, Frankenstein'

LETTERS TO THE EDITOR

Policy should exploit man-machine work transfer

The excellent summation of industrial policy in the article "Industrial policies in an election year" [CW, Dec. 26-Jan. 2] alludes to a fact that raises serious doubts about the wisdom of that policy.

In its Republican and Democratic manifestations, it embodies the principle that labor is one of the primary factors of production.

Technology is providing cost-effective substitutes for a growing percentage of the labor applied to routine tasks.

Advances in prospect indicate that the possibilities for the transfer of work from men to machines are virtually limitless.

Any policy that fails to exploit this potential in a rational manner could cause us to lag in productivity, innovation and cost-effectiveness. We would then lose markets and run the risk of domestic upheavals.

In my opinion, we would be better served by an approach that enhances individual freedom by giving positive effect to the seminal change that is taking place.

We should adopt an agenda that makes the most of the opportunity to transfer work to machines in a way that minimizes adverse consequences for people.

Brian Le Bert-Francis
Falls Church, Va.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

To see a world in a grain of sand

LIGHT ON SCIENCE

CHARLES P. LECHT

The impressive history of integrated circuits, or chips, has been beautifully documented in a book by Stan Augarten, a Silicon Valley writer for the *Peninsula Times Tribune*. Titled *State of the Art*, Augarten's book presents us with a neatly organized photographic history of the chip. He takes us from 1947 through 1983 in two-page couplets, one for text, the other a full-page photograph of contemporary chip technology.

The book's awe-inspiring photographs, presented in this way, give us a temporal perspective on chip development that is singularly rewarding in its unfolding pulchritude. The regularity of patterns achieved, be it found in the simplest "image sensor charge-coupled device" or the most complex "gallium arsenide superprocessor," would make a Navaho weaver green with envy and cause a nervous breakdown in the most competent Persian loomist. The beauty encountered in the contemplation of chip designs makes us wonder whether we are seeing the magnified handiwork of Lilliputian artisans. Like Gulliver unbound, we are amazed witnesses to science's architectural accomplishments in a much littler world.

Integrated circuit "architectronics" include just about every design ever made by man — and then some. That a single chip is usually far less than a quarter of an inch on a side and results from the collaborative effort of hundreds of technical specialists is truly astounding. Orchestration of their collective efforts rivals in complexity any that is needed to produce the objects of our macroscopic world. These multilayered mandalas etched in the realm of microscopy permit us an almost mystical vision that reaffirms what human beings can achieve through cooperation.

Fairchild flattening

Although research leading to today's chips includes work like that done at Bell Laboratories in the 1940s (for example, the Point-Contact Transistor), it was not until 1959 that Fairchild Camera and Instrument Corp. engineers invented a process that could literally level a transistor to operate in a wafer-thin plane and be one-sixteenth of an inch in diameter to boot. As Augarten says, and we can only agree, the transistor is "the wheel, the steam engine, the wellspring of electronics." We must then conclude that in the importance of things in our technological revolution, the Fairchild flattening stands out as monumental. It overcame a major obstacle to chip creation.

After 1959, the leveling process continued at an ever-accelerating rate. And as photolithographic methods, chemistry and engraving techniques improved, so did the potential for increasing the number of gates (that is, transistors) per logic chip while shrinking its planar dimension. The proximity of chip constituents and the laws of physics determined how close chip elements — transistors, circuits and all — could be brought together before the system broke down due to heat, magnetic interference, wandering particles or what have you. The microspace race was on.

The overriding motive in the competition to make the chip as small as possible was — and is — our need to conserve energy in a universe running out of it. Flattening, thus, made sense not only in logic processors, but also in those of memory. The power needed to drive memories on ferromagnetic cores was incredibly expensive compared with what is needed for even larger modern random-access memories (RAM) on chips. Thus, the impetus to produce maximum computing power with the least possible energy led to the microminiaturization of both logic and memory. This was done by further reducing their circuits — astoundingly, not necessarily in length, but in cross section — and reducing their components to pinpoint size and thin as chemistry would allow. That, in turn, resulted in more powerful computers, which (when applied to the process of generating even flatter, denser packaging) allowed us to create systems of even greater potency. And with these, increasingly beautiful and intricate designs emerged.

These I hold to be masterpieces of visual art. Today's artistic community might not catalog these as belonging to its aesthetic world; tomorrow's will. So, for the benefit of the future's chip aficionados, I offer a sampling of some recent classics.

American Micro Devices' Bit-Slice microprocessor of 1975, Model 2901, elaborates a landscaped layout of high-density tract housing suitable for sites on the moon or Mars.

The 1976 version of Zilog, Inc.'s Z80 processor, one of the most popular 8-bit processors ever made, suggests an undeniable resemblance to a modern Earth-city, complete with roads, gardens, apartment houses and parking lots.

The 1977 release of IBM's 64K-byte dynamic RAM is a symmetrical, gleaming beauty. Under a microscope and against a black background, it resembles nothing so much as a space colony in the luminescence of a golden sunset.

The 1979 version of the Motorola, Inc. 68000 and its successors appear as a huge governmental complex that would put Pentagon planners to shame.

And the chips kept getting better — and more beautiful. Xerox Corp.'s Optical Mouse, circa 1980, displays a checkered electronic labyrinth that would baffle the Minotaur. Texas Instrument, Inc.'s 1980 64K-byte dynamic RAM presents a textured column of Byzantine intricacy. The 1981 Hewlett-Packard Co. 32-bit microprocessor appears a keyboard music box containing all the works of Bach.

Possible interpretations of these morphistic mappings are limited only by our imaginations. It doesn't take much, however, to conclude that these patterns encapsulate and recapitulate our mid-cosmic reality in superdense format. The world of the microchip emerges as if it were a planetary surface seen from a satellite in the stratosphere. Yet each view seems to summarize our civilization's endeavors in art and science as though they were at arm's length in a gallery.

Marvel in form

The chip is truly a marvel in form as well as function. Concentrations of power enthroned in beautiful palaces of silver and sapphire, its chambers columned with gold and platinum, its corridors lined with niobium and other precious metals. And yet its chief constituent is the second most abundant substance on the surface of the earth: silicon.

Augarten points out that "in combination with oxygen, [silicon becomes] the chief ingredient of sand — which makes [William] Blake's lovely verse a fitting ode to the [integrated circuit]:

To see a world in a grain of sand
And a Heaven in a wild flower,
Hold infinity in your hand
And eternity in an hour."

Through continued chip evolution, we may yet fulfill Blake's yearning.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Confiscatability key to transporting micros overseas

HUMAN CONNECTION

JACK STONE

Isaac Newton I'm not, but I have recently discovered a new measure of systems quality — "figure of merit" we aging electrical engineers call it — which, though not expected to plunge the industry into technological turmoil, will surely enhance systems performance in one specialized set of circumstances, namely, when transporting one's beloved micro into the lesser civilized regions of the world.

To such conventional systems factors of maintainability, reliability, operability, survivability and shareability, I am adding the notion of confiscatability — the capability of a system to remain in its owner's possession while traveling overseas as opposed to being physically removed from same by members of the local constabulary, generally for an unfathomable reason.

Last winter, I met up with some difficulties in trying to motor my faithful Processor Technology Sol 20 across the Mexican border. It, a companion, my eldest son, Charlie, and I were bounced out of the country quite unceremoniously then because we were attempting to enter with the personal computer, in spite of the polished verbiage in Mexico's travel brochures and the assuaging statements of Mexico's tourism officials that "extend the hands of friendship to all visitors."

As near as we can figure, the customs officers were saying that they were protecting us from potential bandits or unscrupulous police personnel who might eye the machine during a "stakeout," place a high price on it (even though the market value of a six-year-old micro is something approaching that of a Timex 1000), intercept us on a lonely highway and take away the personal computer on some pretext or other, for example, smuggling.

Well, it didn't take too much discussion to decide to make the trek again this year, what with all the bad weather lately, but it was not at all clear as to what computer facility we were going to take along. No way the Sol was going again, because it was proven that its "body print," that is, volume profile, was terribly obvious to the Mexican federales.

Osborne transportable

I returned again to the possibility of an Osborne Computer Corp. transportable that seemed initially appealing because of its packaging and its price (now a glorious bargain for only $800 from a K St. vendor for a used system, including Micropro International Corp.'s Wordstar, in spite of its ridiculous 5-in. amber screen.)

The body print was certainly better than the Sol's, but my interest began to wane after I attempted to pick up the machine, and I found that its 28 pounds seemed more like 128 pounds. Then I perked up when the salesman directed me to a special word processing package for the Osborne, called "Word-something-or-other," to be confused with all the other "Word"-oriented WP software titles. Then the salesman went on to advise me that he had no sample documentation. He wasn't sure what was provided, but he knew the programs were very "powerful" and "exactly what I needed," and "because I was such a good customer" (I'd never made a purchase there), he was going to give me 5% off.

I rejected the Osborne, not so much for its confiscatability, but for considerations of viability. Somehow, the idea of an archaic machine with unknown software supplied by an off-the-wall retailer seemed to fall just a bit short of my personal computer goals in spite of its highly favorable pricing.

VIEWPOINT

Moving into the world of technology

READER'S PLATFORM

ROBERT A. KING

Nine years ago it all began. The purpose was to supply the much-needed nutrition of fruit to the multitudes. The idea was to package the fruit economically and compactly and distribute it on schedule each quarter of the year. The idea emerged to dehydrate the fruit for distribution and sell hydrating machines to the consumers. A fruit indexing system was incorporated to access quickly the necessary items.

Basically, the system works like this. The consumer owns a cardboard-and-vinyl fruit storage unit in which he stores the current quarter's fruit shipment. As the need arises, he uses the fruit index to locate the correct fruit to be consumed. The consumer then removes the fruit and places it in the hydrating machine.

For years, business was adequate, but the number of consumers increased. As technology advanced, it was decided to develop and market a new system of fruit distribution; why should the consumer go to so much trouble to receive the necessary fruit nutrition?

One idea that is being considered is the "on-line" system. This is where all the consumers' fruit in a certain area is stored in one large main storage unit. The dehydrated fruit is shipped to this storage unit and then is made available to the consumers who use what are called "maindraters" and/or "minidraters." The consumer makes a connection to the main storage by pushing buttons that put him on-line.

He then uses the storage units' indexing system to locate the needed fruit. As it is located, it then is shipped to the individual through a pipeline for consumption.

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Problem with systems

A problem with this system is that sometimes it is not possible to make an immediate connection to the main storage unit or is slow in doing so. Another difficulty is that sometimes the connection is broken at a critical time, and the fruit is dematerialized as it passes through the pipeline and is lost to the consumer.

Upper management chose the microdrater as the integral component for the new system and utilized existing employees' talents to finalize the system. The technological advantage of the microdrater is that it not only provides on-site storage, hydrates and spoon-feeds the fruit to the consumers, but it has a built-in indexing system that is energy efficient. This has been termed a "stand-alone" system.

This seems to be the system of the future, only there are a few bugs to be worked out. Being that the multitudes require so much fruit, technology has yet to produce an adequate storage bin for the microdrater. But time will take of this.

Also, whereas in the old system the fruit was loaded into storage by a human, the microdrater requires that the fruit be loaded mechanically from microdrater cartridges. In the past, the fruit was dehydrated and distributed for us by another company with the facility to do this. What has to happen now is to find a microdrater cartridge processor to perform a similar service for us. It will be at that time that the microdrater "stand-alone" system of fruit distribution will be in use by the multitudes.

A minor question arises when discussing this type of system: "Will the consumers be willing to pay the substantial monetary increase in the price of the microdrater over the manual hydrating machine that they now use?" Time will tell us that.

This concludes this business report. Thank you. ‡

King is computer operations manager at Micromedex, Inc. in Englewood, Colo.

SOFTWARE & SERVICES

The evolution of the meddlers

SOFTLINE

FRANK SWEET

"Why does the data base administrator keep meddling in my business? Worse yet, his goals are not the same as mine!"

This often-voiced accusation is completely accurate. Data base administration does cross turf boundaries with distressing regularity. And its goals really don't seem to match those of the people whose business is meddled with. To see why this is inevitable, consider the data base administrator's evolution as an organizational unit.

The concept arose in 1971-72. Data base administration emerged when it appeared that shared master files were practical at last. Packages were being sold which seemed to solve the problems of different applications sharing the same set of files. A committee from IBM's Guide users group was formed to study the organizational implications, and the first data base administrator job description was published on Nov. 3, 1972. Later publications have not changed that description significantly.

But every one of the data base administrator's job functions was already in place in the traditional DP organization. File design, data security, file integrity, master backups, I/O software maintenance and training, data naming standards, record layout documentation and so forth were all being performed. In most shops, the tasks were being performed well. Since the job was getting done, why was the system changed?

The functions were dispersed throughout the organization. In the old DP shop, different people were responsible for different aspects of master file integrity:

- Users designed individual fields. For example, "marital status code" was defined to be 1-single, 2-married.
- Systems analysts designed records and files. They determined, for instance, that each purchase order record contained the field "vendor number" and

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CICS gets Executrieve

Eases on-line query for novices

FORT LEE, N.J. — On-Line Software International has announced a free-format, on-line IBM CICS query system that is said to use a simple English syntax.

ON-LINE SOFTWARE INTERNATIONAL

Called Executrieve, the product is designed for users with no programming experience. The software allows users to query the data base and develop reports that include graphics. It operates under CICS in IBM OS and DOS environments without modification or reformatting, a spokesman said.

Users access the mainframe through "views" or groups of data fields matched for various user groups. User groups only have access to fields defined by data processing. Executrieve's Content Addressed Method technology lets users locate information based upon content rather than pre-established keys or indexes, the spokesman said. It is said to use less overhead than standard accessing techniques.

A nine-tier system of security is provided, and record count limitations can be imposed. The system can be installed in a few hours, the company claimed.

Introductory pricing is $15,000 for DOS and $20,000 for OS until March 1, after which prices will rise to $18,000 for DOS and $24,000 for OS, according to the vendor.

On-Line Software International, Two Executive Drive, Fort Lee, N.J. 07024.

IBM hikes DSLO, license fees

IBM has increased its monthly license fees and Distributed System License Option (DSLO) prices on six program products.

The monthly license fee on the Professional Office System program product was increased from $600 to $700. Likewise, the DSLO for that package was increased from $450 to $525, IBM said.

The Cross System Product/Applications Development package now costs $185 for a monthly license and $140 for the DSLO. The product used to cost $160 for the monthly license and $120 under the DSLO, IBM said.

Applications execution

The Cross System Product/Applications Execution now costs $140 for a monthly license and $105 under the DSLO. The program used to cost $120/mo and $90 under the DSLO.

The Cross System Product is an applications generation package for use with IBM CICS, DOS/VS, VM/SP/CMS, MVS/TSO, SSX/VSE and DPPX/SP operating environments, a spokeswoman said.

Also increased were prices for three program products for IBM's 8100 distributed processing system.

The basic license fee for the 8100 message-handling facility, DPPX/Presentation Services 3640-Execution Manager, was increased from $71 to $75 for a basic license, and the DSLO has been increased from $52 to $64/mo.

Likewise, the DPPX3640-Interactive Transaction Generator has been increased from $297 to $312/mo for a basic license, and the DSLO has been increased from $223 to $265/mo, the spokeswoman said.

Finally, the Distributed Office Support System/8100/Distributed Office Support Facility was increased from $178 to $187/mo for a basic license, according to the spokeswoman.

The DSLO has been increased from $133 to $159/mo, IBM said.

All price increases take effect in March 1984, the spokeswoman said.

IBM National Accounts Division, 1133 Westchester Ave., White Plains, N.Y. 10604.

Mantis out for CMS/41

stsc

STSC offers VM-based micro-mainframe link/42

STATS

Honeywell users get health care claims system/46

INSIDE

■ DOS to OS conversion tool unveiled/41

■ Report writer available for System/38/47

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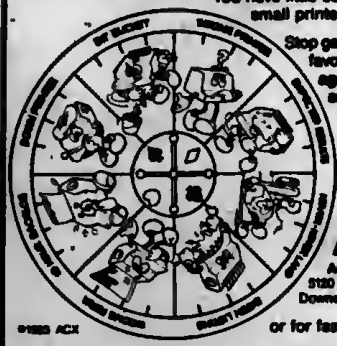

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MEDDLE from page 39

that the vendor master file was to be updated once each month.

■ Technical support selected and maintained nonapplication system software. System programmers were traditionally responsible for reorganizing Isam files, defragmenting packages and training systems and peripherals personnel in Vsam use.

■ DP operations answered for the physical well-being of the files. Operations supervisors saw to it that backup copies were sent off-site and that vendor master files and vendor transaction files were kept on two different spindles.

File sharing demanded that the functions be consolidated. Something happened when file sharing among different users' applications became a realistic goal. It became evident that the central data pool could be achieved only if the responsibility for file integrity was centralized. To be shareable, files had to become orders of magnitude more reliable than ever before.

But consolidating the functions didn't eliminate them, hence the inevitable overlaps. Centralizing file reliability/integrity functions did not eliminate the concerns that older organizational units had toward master files. Indeed, such concerns cannot and should not be eliminated since, ultimately, computerized business data is the responsibility of the entire DP team.

Overlapping functions don't always match perfectly. The key concept is shared master files. The data base administrator's primary goal is to make master files shareable by all users and among all applications. Hence, the administrator is compelled to become involved in all aspects of file design and use in order to ensure that this goal is met:

■ Users — If three users have adopted a common set of marital status codes, but a new user wants to invent his own, the data base administrator reacts by encouraging the maverick to join the others.

■ Systems and programming — If our vendor master file contains the "vendor address" data, but a designer wants to replicate this field on each purchase order record, the data base administrator will point out the ease of vendor master file access when printing or displaying a purchase order and the risk of inconsistency if the field is replicated.

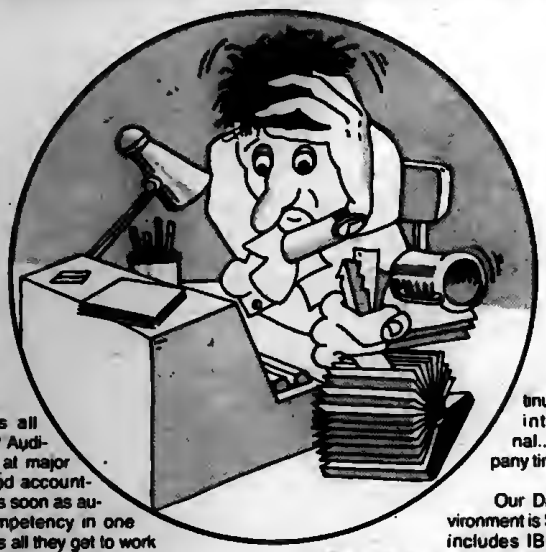
■ Technical support — If disk access software is proposed which is more machine-efficient than the data base package but does not roll back abended transactions and batch jobs without intervention, the data base administrator becomes involved by arguing against its adoption. Without automatic rollback, the files could be used only one system at a time.

■ DP operations — If DP operations neglects to make periodic tape backup copies of the files or forgets to store the backups off-site, the data base administrator should detect the lack and inform appropriate management of the jeopardy to the firm's business data.

In sum, don't be embarrassed to accuse data base administrators of meddling in your business. You're right. They do. It's their job.

Sweet is corporate manager of data administration for the Charter Co. in Jacksonville, Fla., and a regular contributor to Computerworld's *Softline column.*

EDP Auditors... Being Pigeon-Holed Seldom Leaves Room For Advancement.



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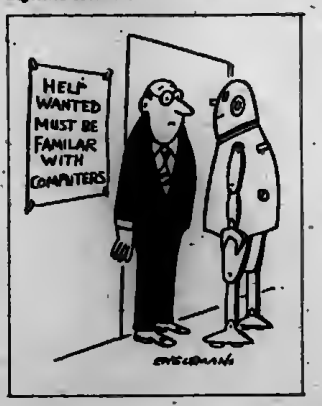

'Changer II' supports OS

HOUSTON — Software Dynamics Corp. has announced the Changer II IBM DOS to OS conversion system.

A spokesman said the Changer II system organizes and manages the conversion effort and speeds it up so that application system changes are frozen for a shorter period of time. The package is said to force conformance to OS standards and conventions, and it can be modified to satisfy standardization requirements.

The spokesman said that Changer II is not an emulator, but actually converts source program code. Changer II is said to simplify the development of OS JCL by calculating efficient disk space allocations, block sizes, number of sort work files and sort work space allocations. It also formats JCL according to predefined standards, the spokesman said. Changer II is also said to ensure adherence to uniform naming conventions throughout the system, and it produces reports that monitor and organize the conversion effort.

Various DOS to OS conversion options are available, including a one-year lease of the Changer II conversion system for $59,000.

Software Dynamics, Suite 1000, One Allen Center, Houston, Texas 77002.

Mantis enhanced

CINCINNATI — Cincom Systems, Inc. has announced an IBM CMS version of its Mantis fourth-generation application development system.

Mantis is described as an on-line, interactive application development system which, the vendor said, allows for the implementation of entire applications without the need for batch processing. In the CMS environment, according to a spokesman, Mantis eliminates the majority of operating system and teleprocessing monitor overhead associated with other environments.

With Mantis, programmers reportedly can create screens, test and debug applications, document systems, put systems on security menus and release applications for production. The fourth-generation language is said to combine the flexibility of procedural languages and the efficiency of interpretive languages to enable users to implement top-down design, structured coding, step-level refinement and prototyping of systems.

Reportedly, applications developed under CMS Mantis are transferable to IBM's CICS Environ/1 or Cincom's TIS environments without change. In the CMS environment, Mantis is said to run without isolating each user, and security is maintained for individual or department files without affecting other system users. The CMS version is said to work with a variety of file-access methods, including Vsam, Cincom's Total data base management system (DBMS), TIS DBMS and standard Mantis files. All output printing is automatically routed to the system printer.

The single-user charge for the CMS version of Mantis is $36,000 for IBM Models 4321, 4331, 4361, 370/125, 370/135 and 370/138; $45,000 for Models 4341, 4361 and 370/145 and up; and $64,000 for IBM's 30 series mainframes.

Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.

Upgrades fit CMF, IMF

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced two information resource planning and control products, the CMF/Workload Planner and the IMF/System Manager.

The CMF/Workload Planner is a recent enhancement to the firm's Capacity Management Facility (CMF) architecture. It helps to provide future work load demand projections based on analysis of an organization's business activities.

According to the vendor, the Workload Planner analyzes historical work load activity data, condenses that data into a planning data base, determines transaction rate trends and constructs work load forecasts that are passed directly to CMF/Model, which produces projections of future service levels and resource requirements.

The IMF/System Manager, an enhancement to the IMS Management Facility, was designed to improve the quality of IBM IMS service. It replaces with menus the discrete commands and responses required by IMS and permits review and control of the IMS resource status via available panel displays, the vendor said.

The System Manager also automates routine procedures such as restarting transactions, programs or message regions following an abend; starting or restarting IBM integrated storage controller links; and notifying the appropriate personnel of significant occurrences within the system.

The Workload Planner is priced at $16,000 for the first CPU; the System Manager perpetual license fee is $28,500 for the first CPU.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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NCR Micrographic Systems Division

NCR provides worldwide service and support for the NCR 5300 COM Systems.

Tool targets VM users

ROCKVILLE, Md. — STSC, Inc. has announced Dataport, said to be an information center tool that operates on IBM processors under IBM's VM/CMS and VM/SP operating systems and provides full screen data entry, display and analysis functions that interface with a variety of microcomputer and mainframe software products.

According to the vendor, Dataport's interfacing capabilities allow users to pull data from and send data to packages, including Information Builders, Inc.'s Focus; SAS Institute, Inc.'s SAS; Execucom, Inc.'s IFPS; IBM's ADRS-II; Visicorp's Visicalc; and Lotus Development Corp.'s Lotus 1-2-3.

Dataport reportedly can also be interfaced with any mainframe or micro product that utilizes Software Arts, Inc.'s Data Interchange Format.

The vendor said Dataport uses spreadsheet-like windowing technology to handle full screen data entry and display, and it extends the two-dimensional spreadsheet format to as many as six dimensions. The package reportedly performs complex analysis through sophisticated computational logic and can perform calculations on entire rows or columns or on a single element.

Dataport is available for a one-time license fee of $19,000, with an additional charge between $2,000 and $4,000 for each interface.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

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BLUE LYNX is a trademark of Techland Systems Inc.
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Warner adds to data bank

NEW YORK, N.Y. — Warner Computer Systems, Inc. has announced the addition of the Disclosure II data base to its Financial Services Division data bank.

Disclosure II is said to be an enhanced data base that contains facts and figures on approximately 8,500 companies required to file annual and periodic reports with the Securities and Exchange Commission (SEC).

According to the vendor, more than 90 categories of information are available for each company, and standard reports include balance sheet information, income statements and financial ratios.

The fee structure, which is based on the type of reports accessed and the level of usage, ranges from $2 to $30 per connect hour.

Warner's Financial Services Division, 605 Third Ave., New York, N.Y. 10158.

Firm widens maintenance

OAK BROOK, Ill. — Sentinel Computer Services, Inc. has announced the expansion of its maintenance services to include the IBM System/34 and System/38 within its network maintenance agreement.

Effective immediately, Sentinel will provide maintenance, installation, discontinuance and relocation services in its recently established industrial and communications network maintenance program. Under the program, Sentinel will provide complete maintenance management services for organizations with complex teleprocessing networks.

A spokesman said the typical monthly maintenance fee for a System/34 user is approximately $207 and $395 for a System/38 user.

Sentinel Computer Services, Suite 360, 1010 Jorie Blvd., Oak Brook, Ill. 60521.

SYSTEMS SOFTWARE

KOORTRONICS, INC.
Hierarch — The Secure OIS System

Koortronics, Inc. has announced Hierarch — The Secure OIS System, which is said to secure printouts and access to all system resources for the Wang Laboratories, Inc. Office Information System (OIS) small business computer.

According to the vendor, the security system was designed to secure printouts and access to system resources according to the user's hierarchical authority, the particular device and the concerned library. The package includes user password logon and automatic logoff procedure, document antiaccess lock, library security and control over individualized local menus.

The vendor said the system is compatible with all Wang OIS software Releases 5.0 and higher and is supplied on two OIS salable diskettes. The package is said to occupy less than 1,200 sectors of the OIS system resident volume. The system is priced at approximately $10,000.

Koortronics, Two Park Ave., New York, N.Y. 10016.

HELP/38 SYSTEMS
Robot38 Version 3

Help/38 Systems, a division of Advance Circuits, Inc., has announced Version 3 of its Robot38, an automatic computer operator for the IBM System/38 mainframe.

According to the vendor, Version 3 contains 19 enhancements to the package, including Help text display, command prompting and syntax checking. Said to require four seconds of CPU time/hour, Robot38 reportedly improves response time for data entry operators by allowing the System/38 to be used up to 24 hours/day and by automating a number of maintenance tasks.

The productivity software is said to execute programs and commands without operator intervention or attendance, and it automatically schedules, runs and documents jobs during off hours.

The user can preschedule jobs to run at any time or on any selected date, with recurring jobs run on evenings or weekends, the vendor said. Robot38 will monitor and correct data communications line status, opening lines to receive transactions during night or day while maintaining system security.

Version 3 of Robot38 is leased for $30/mo per CPU or for a one-time cost of $1,100 per CPU.

Help/38 Systems, 15102 Minnetonka Industrial Road, Minnetonka, Minn. 55343.

D.B. SYSTEMS, INC.
Release 2.0 of Network Messenger

D.B. Systems, Inc. has announced Release 2.0 of its Network Messenger electronic mail system, which offers enhancements emphasizing office productivity and operational flexibility.

The enhanced version allows users to create various reusable letter, report and other formats to be stored permanently in a common or individual electronic filing cabinet. Message formats may be modified on-line and sent to various recipients as required, the vendor said.

Enhancements of the electronic mail system also provide for storage and on-line access to various system and office procedures that may be updated on-line by a central department, according to the vendor.

The DL/1 data base system operates under IBM's IMS/DC or CICS access methods.

The price is $7,900.

D.B. Systems, 2 S. Patton Ave., Arlington Heights, Ill. 60005.

TECHNETRONIC, INC.
Copernicus Model Release 2

Technetronic, Inc. has introduced its CPU-capacity management software for use in answering data center growth questions in IBM MVS and VM environments.

The Copernicus Model Release 2 predicts the effects on data center performance of hardware upgrades, work load increases and new applications.

According to the vendor, the software interprets column-of-numbers output, providing the user with a graphics display of its predictions. Results can be presented in any of the eight-color graphics formats included with Copernicus.

The product is available as an option for Technetronic's Copernicus 320 system for a one-time license fee of $7,000.

Technetronic, Suite 400, 7927 Jones Branch Drive, McLean, Va. 22102.

See SYSTEMS page 44

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SOFTWARE & SERVICES

SYSTEMS from page 42

COMPUTER INFORMATION SYSTEMS OF MASSACHUSETTS, INC.
VMS/Actsys; Prolog

Computer Information Systems of Massachusetts, Inc. has announced a resource accounting package and utility designed for use with Digital Equipment Corp. VAX-11 computers running DEC's VMS operating system.

VMS/Actsys reportedly is a menu-driven resource accounting package that monitors and bills system resources and software usage.

Prolog, said to be an optional extension of VMS/Actsys, is a project resource accounting utility that lets the user switch projects without logging out and in repeatedly.

VMS/Actsys' billable resources are said to include connect time, CPU time, page faults, buffered I/O, direct I/O, volumes mounted, pages printed, disk storage and software license fees at prime and off-prime rates.

Resource usage information reportedly can be extracted interactively or set to run automatically at a user-specified time.

The products operate on single VAX-11 systems, VAX networks connected with DEC's Decnet and VAX clusters. They will be available in April.

VMS/Actsys is priced at $3,900 and Prolog at $900.

Computer Information Systems, 165 Bay State Drive, Braintree, Mass. 02184.

PRODUCTIVITY AIDS

PACER SOFTWARE, INC.
C68; A68; L68; Lib68; X68; S68

Pacer Software, Inc. has announced an integrated cross-development environment for the Motorola, Inc. 68000 family that runs on Prime Computer, Inc. Prime 50 series computers.

The new products that make up the environment are designed for companies that develop microprocessor-based hardware and are said to be suitable for educational settings that plan to teach microprocessor architecture.

The C68 is a C cross-compiler for the Motorola 68000 and is source-level-compatible with the Prime native-mode C compiler. Applications can be developed and debugged in the mini-based environment and later ported to the micro without losing compatibility, the vendor said.

The A68 is a Motorola Exormacs-compatible M68000 cross-assembler and includes support for long symbol names, multiple code sections and an extensive macro capability, the vendor said.

The L68 is a 68000 cross-linker with library support. The Lib68 is a 68000 object-module librarian.

The X68 is a cross-reference utility that can be utilized in conjunction with either L68 or A68. The S68, a 68000 simulator, is designed so that the content of the memory and registers can be examined and changed from within the simulator.

The C68, L68, Lib68 and X68 package costs $5,000. The A68, an add-on to the package, costs $2,000.

The A68, L68, Lib68 and X68 package sells for $3,000, while the S68 costs $1,500.

Pacer Software, 1227 Pearl St., La Jolla, Calif. 92037.

APPLICATION PACKAGES

META SOFTWARE, INC.
Charms

Meta Software, Inc. has announced the Chart Abstracting and Review Management System (Charms), which is said to be an on-line hospital-records software system.

According to the vendor, Charms is an interactive system that can be adapted to most hospital environments. The extensive clinical data collected by the system is integrated with a Diagnosis Related Grouping module, which generates the information on-line.

The system consists of three optional modules: The Medical Records Abstracting System (Mras) captures and provides clinical patient information and allows the user to enter, modify or make queries on all patient data, according to a spokesman for the company. The Missing Information Charts (MIC) module captures detailed information regarding the status of each patient chart. It reveals missing information, validates data and communicates that information to both doctors and management. The Utilization Review (UR) portion is a quality assurance system, which assists in the tracking of a patient's stay in the hospital, the spokesman said.

The Charms system was designed for use with IBM 370, 4300 and 303 series processors in IBM OS and DOS environments. The Mras module is priced at $50,000, the MIC module at $25,000 and the UR module at $25,000.

Meta Software, 1860 Broadway, New York, N.Y. 10023.

TEXPRINT, INC.
EZ Chart

Texprint, Inc. has announced EZ Chart, a graphics package for Digital Equipment Corp. PDP-11, LSI-11, VAX-11, PDP-10 and PDP-20 computers.

EZ Chart, which runs on either black-and-white or color terminals, produces four types of charts: line,

Continued on page 46

The Data Center is under your command.

But is it under your control?

Value Computing's systems management software automates the critical tasks of production forecasting and scheduling, capacity planning, and resource allocation and accounting, and brings those tasks under centralized control. Your control.

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VALU-LIB—An entirely new tape management system designed for today's VS environments.
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Value Computing, Inc., 490 N. Kings Highway, Cherry Hill, NJ 08034 (800) 257-8242. In New Jersey (609) 482-2500

How to put 640 square feet of computer disk storage in a 7'x3' space.

There's no way to store that much data in that little space if you're using disk drives. Even 3380 class. But Masstor Systems' M860 Mass Storage System — a different kind of data storage technology — can solve the problem.

The entry-level M860 stores 55 billion bytes of data on-line and can be expanded to 440 billion bytes. At one-quarter the cost of disk. And less than 4% of the floor space. It also automates tape operations, making processing much faster and more economical.

The M860 is a third storage alternative for your IBM and other plug compatible mainframes. One that offers more on-line storage capacity for your new applications and requires no conversion of your existing programs. Masstor has an M860 solution for Sperry, Honeywell, DEC/VAX and CDC mainframes, too. As well as a way to hook them together in a network: MASSNET.

The M860 and MASSNET are two of a family of Masstor Systems' strategic products that allow you to move, store and share data efficiently and economically.

To find out more, contact Dave Ball at Masstor Systems Corporation, 5200 Great America Parkway, Santa Clara, California 95050. (408) 988-1008. And cut your data storage problems down to size.

MASSTOR SYSTEMS

Strategic solutions to moving, storing and sharing data.

SOFTWARE & SERVICES

Continued from page 44

ber, pie and scattergram, according to the company. The package runs interactively and includes a command-file feature for quick recall of often-used formats.

EE Chart costs $995 for the RT-11 operating system and is priced at $1,750 for RSX-11M, RSTS/E, VMS, and Tops-20 operating systems.

Tempriet, 8 Blanchard Road, Burlington, Mass. 01803.

COMPUTECH CORP.
Group Rating and Sales Proposal System

Computech Corp. has announced its on-line, interactive Group Rating and Sales Proposal System (GRASP) for IBM 4300, 370 and 30 series processors.

Modular in design, GRASP is said to feature on-line entry of census and coverage data with automatic policy rating and proposal page generation. The system reportedly leads the user through a logical progression of data entry screens to enable input of employee census information and selection of appropriate levels of coverage for each line of insurance selected. Error messages alert terminal operators to omissions or invalid entries.

The system also is said to support production of multiple versions of a proposal from a single input of employee census data, and pending proposals are maintained on a separate GRASP data base for a user-specified time period. Built-in text editing facilities permit additions, deletions and changes to standard text paragraphs that the system creates based on the specific rating situation.

An integrated table management system is said to provide for on-line maintenance of multidimensional rate tables.

A permanent license for GRASP is priced at $220,000.

Computech, 2534 Main St., Glastonbury, Conn. 06033.

SOLUTIONS THROUGH ADVANCED TECHNOLOGY SYSTEMS, INC.
Claimsaver

Solutions Through Advanced Technology Systems, Inc. (Stats) has introduced Claimsaver, a health care claims processing system for Honeywell, Inc. computers.

The system processes different types of health care claims, accommodates a wide range of insurance coverage and produces various management reports, according to the vendor. The package is designed for businesses that process health care claims internally.

The software requires Honeywell's Gcos 3.0 operating system. The package's price ranges from $120,000 to $400,000, depending on the installation. Yearly maintenance fees consist of 10% of the software purchase price.

Stats, 244 Perimeter Center Pkwy. N.E., Atlanta, Ga. 30346.

MCBA, INC.
Fingraph-MCBA Connection

MCBA, Inc. has announced Fingraph-MCBA Connection (FMX), said to be a package that transforms MCBA's general ledger data into graphics input for the Fingraph visual management support system.

FMX compresses data from the General Ledger package and generates graphics reports that correspond to a user's tabular general ledger reports, the vendor said.

The package, written in Dibol, runs on Digital Equipment Corp. VAX-11 minicomputers. Single-CPU source code license is available for $1,000.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

SHARED FINANCIAL SYSTEMS, INC.
ON/2

Shared Financial Systems, Inc. has announced ON/2, an on-line financial software system designed to run on the Stratus/32 continuous processing system from Stratus Computer, Inc.

ON/2 supports a range of banking services within a variety of operating systems. It offers transaction support for demand deposit, time deposit, certificate of deposit, credit card and access card applications through automated teller machines and manned and point-of-sale terminals. Multiple-host, multiple-device and switch-type configurations are also maintained.

Seven major subsystems are combined to process transaction requests from a local network, a switch or host communication system environment, an information service, a batch system interface or a network/system control service environment, a spokesman said. Other features include distributed processing capabilities, device independence, network settlement and reconciliation and multitasking system architecture.

The system will be available in May. It will be priced at $150,000 for a permanent license.

Shared Financial Systems, Suite 650, 15301 Dallas Pkwy., Dallas, Texas 75248.

COMPUTER DATA CORP.
Distribution Resource Planning

Computer Data Corp. has announced a resource planning system for the wholesale distribution industry.

The Distribution Resource Planning (DRP) system is designed to work with Computer Data's sales order processing, inventory control and purchase management systems.

It reportedly allows distributors to anticipate lumpy demand with increased visibility into the future. It is said to handle seasonal and other

NOW CCA'S MODEL 204 DBMS CAN DO SOMETHING EVERY EXECUTIVE CAN APPRECIATE.

SOFTWARE & SERVICES

changing customer ordering patterns, fluctuating transportation lead times and other variables.

The DRP is said to use various simulations for forecasting, making comparisons against actual historical performance and automatically selecting the strategy that most closely approximates actual performance.

The system runs on Hewlett-Packard Co. HP 3000 and Digital Equipment Corp. VAX-11 superminicomputers. It requires the sales order processing, inventory control and purchase management systems to operate.

The DRP will be available during the second quarter of 1984. The prerequisite systems are priced at $15,000 each, and the DRP costs $5,000.

Computer Data, Eighth Floor, 5757 W. Century Blvd., Los Angeles, Calif., 90045.

DATA BASE MANAGEMENT SERVICES

MICHAELS, ROSS & COLE LTD.
Mro-Reporter Release 2.0

Michaels, Ross & Cole Ltd. has enhanced its Mro-Reporter module for the IBM System/38, which allows users to create reports.

Release 2.0 of the report-writing module features shared-access path logic and free format-field entries that can be based on calculations from other fields. Other features include on-line Help, multilevel security, relational file joining, Boolean selection criteria and output device control, the vendor said.

Mro-Reporter runs on the IBM System/38. A one-CPU license costs $1,140, and the maintenance fee is priced at 10% per year.

Michaels, Ross & Cole, Suite 501, 1301 W. 22nd St., Oak Brook, Ill. 60521.

BEDFORD RESEARCH ASSOCIATES, INC.
Interactive Signal Processing

Bedford Research Associates, Inc. has announced the Interactive Signal Processing package (ISP) for Digital Equipment Corp.'s VAX-11 series of processors.

In a single, integrated system, according to the vendor, ISP combines signal processing functions, data management, two- and three-dimensional graphics capabilities and an interactive programming language. The vendor said the unified analysis approach incorporated with the package will establish a controlled environment for research and development.

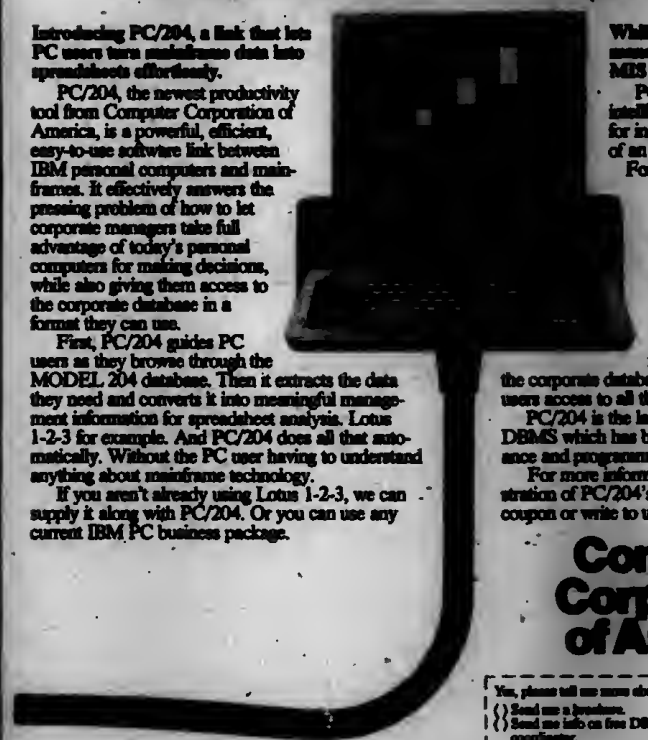
ISP is said to reduce signal processing research and development time. The package allows a user to interactively apply one or more of the 42 available signal processing functions to an array of sampled data. The sampled data, processing parameters and other associated information can be accessed through ISP's file-management capabilities. Signal data and processing parameters can be displayed in various two- and three-dimensional formats utilizing one of ISP's 15 graphics functions, according to a spokesman for Bedford Research Associates.

ISP is also programmable, allowing a user to develop more complex applications with loops, conditional branching and embedded arithmetic expressions.

The package licenses for $9,500, the spokesman said.

Bedford Research Associates, 4 DeAngelo Drive, Bedford, Mass. 01730.

TALK SENSE TO THE IBM PC.



Introducing PC/204, a link that lets PC users turn mainframe data into spreadsheets effortlessly.

PC/204, the newest productivity tool from Computer Corporation of America, is a powerful, efficient, easy-to-use software link between IBM personal computers and mainframes. It effectively answers the pressing problem of how to let corporate managers take full advantage of today's personal computers for making decisions, while also giving them access to the corporate database in a format they can use.

First, PC/204 guides PC users as they browse through the MODEL 204 database. Then it extracts the data they need and converts it into meaningful management information for spreadsheet analysis. Lotus 1-2-3 for example. And PC/204 does all that automatically. Without the PC user having to understand anything about mainframe technology.

If you aren't already using Lotus 1-2-3, we can supply it along with PC/204. Or you can use any current IBM PC business package.

While PC/204 is helping business managers, it's also helping MIS directors.

PC/204 uses the power and intelligence of the personal computer for increasing the overall efficiency of an application.

For one thing, it improves performance of the mainframe by offloading some of the processing to the PC, while reducing PC users' response time. It also makes communication between the PC and the mainframe more efficient.

What about security and control? PC/204 provides individual management views of the corporate database while still allowing PC users access to all the information they need.

PC/204 is the latest reason to get MODEL 204 DBMS which has been so highly rated for performance and programmer productivity.

For more information or to arrange for a demonstration of PC/204's capabilities, simply return the coupon or write to us on your letterhead.

Computer Corporation of America

CCA's Executive DBMS Seminar Schedule

February	March	March (cont'd)	April	April (cont'd)
Denver	Salt Lake City	Richmond	Phoenix	Washington, D.C.
Dallas	Tulsa	Hartford	Little Rock	Boston
San Francisco	Houston	Rochester	New Orleans	Albany
Seattle	Portland, OR	Saddle Brook, NJ	Anchorage	Princeton
Los Angeles	Honolulu	New York	San Diego	Raleigh
Chicago	Minneapolis	Jacksonville	St. Louis	
Madison, WI	Detroit	Tallahassee	Cleveland	
Philadelphia	Columbus, OH		Dayton	
Boston	Louisville		Philadelphia	
Ft. Lauderdale	Pittsburgh		Norfolk	

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CW1/25PC

LANGUAGES

MUMPS USERS GROUP
ANS Mumps: Software Engineering Evolution Toward the Fifth Generation

The Mumps Users Group has published *ANS Mumps: Software Engineering Evolution Toward the Fifth Generation*, which includes a section on the evolution of the programming language since its inception in 1966.

The publication also includes a 12-page set of tables comparing more than 40 available Mumps implementations and including the name, address and phone numbers of the sources. It also offers a list of hardware from 22 suppliers for which Mumps implementations exist.

A Software Engineering Methodology section examines three implementations, including the development of a software data base, terminal-to-terminal portability and a color graphics workstation.

The publication is available for $5 for association members and $6 for nonmembers, plus a 10% shipping charge, according to a spokesman for the users group.

Mumps Users Group, Suite 208, 4321 Hartwick Road, College Park,

PERFORMANCE SOFTWARE GROUP
Fastran

Performance Software Group has announced Fastran, a compiler for Hewlett-Packard Co. HP 3000 Transact source code.

According to the vendor, CPU times are improved by two to 20 times using the compiler.

The product has been designed to run on any HP 3000. An HP SPL compiler is also necessary, the vendor said.

The price is $10,000.

Performance Software Group, P.O. Box 1464, Sandy Spring, Md. 20860.

SOFTWARE & SERVICES

REMOTE COMPUTING SERVICES

INFORMATION ACCESS CO.
Search Helper/prepaid searches

Information Access Co. (IAC) has announced the combination of its Search Helper microcomputer software with a package of prepaid searches designed to reduce the average cost of a search of a company's on-line data bases.

According to the vendor, Search Helper provides menus to coach the user in establishing search parameters off-line.

Once the search criteria are established, the package automatically dials IAC's Dialog Information Services, and the search begins.

Search Helper is currently designed for use with the IBM Personal Computer, the Apple Computer, Inc. Apple IIe and Apple II+ and the Eagle Computer, Inc. Eagle II.

The combination package includes an annual Search Helper license, priced at $200, and 700 prepaid searches, valued at $1,750, for a cost of $1,950.

The package is said to reduce the cost of a typical search from $15 to $2.50.

IAC indexes on-line through Dialog include Newsearch, the Magazine Index, the Trade and Industry Index, the Legal Resource Index and the National Newspaper Index, according to a spokesman.

IAC, 404 Sixth Ave., Menlo Park, Calif. 94025.

NEWTON-EVANS RESEARCH CO.
Guide to the Remote Computing Services Industry

Newton-Evans Research Co. has announced the publication of the third edition of its single-volume *Guide to the Remote Computing Services Industry.*

A condensation of its sources of information on the remote computing services (RCS) industry, Newton-Evans' guide is organized around four major sections.

The first section consists of extracts of original research reports based on periodic surveys of the RCS marketplace, plus results from studies planned for 1984 as they become published.

The second section is a collection of the firm's monthly publication "The RCS Industry Newsletter."

A third section includes detailed profiles of the most important RCS suppliers. The fourth section is an industry analysis.

The basic subscription price is $595.

Newton-Evans Research, Suite 204, 10176 Baltimore National Pike, Ellicott City, Md. 21043.

ON-LINE DATA BASES

CAUSE
On-line member data base

Cause, a professional association for development, use and management of information systems in higher education, has announced that on-line information from its members' institutional profiles is available to its members.

Information from 150 data processing departments with 10 types of applications, including financial management, admissions and records and physical operation, has been placed in a data base, according to the vendor.

Members call the Cause office, and staff members use an on-line system to find the needed information.

Data may be selected by a variety of categories. There is no charge for the service.

Cause membership cost between $100 and $1,000, depending on the size of the institution.

Cause National Office, 737 29th St., Boulder, Colo. 80303.

METHODOLOGIES

AGS MANAGEMENT SYSTEMS, INC.
Structured analysis course

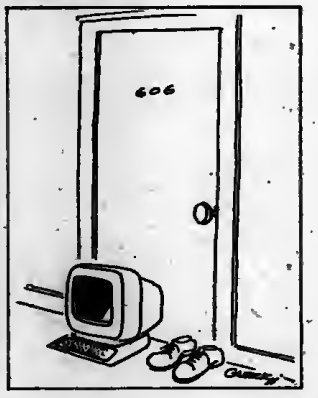
AGS Management Systems, Inc. has announced the first of a five-course series on structured techniques.

"Structured Analysis: Tools and Techniques" will be conducted Feb. 21-23 and March 27-29 at the AGS Training Center in Philadelphia.

The three-day workshop is designed as an introduction to the analysis process and will cover data-flow diagrams, data dictionaries and process descriptions, according to the sponsors.

The fee for the workshop is $550.

AGS Management Systems, 890 Valley Forge Plaza, King of Prussia, Pa. 19406.



COMMUNICATIONS

FCC still facing AT&T petitions

AT&T and its recently divested operating companies have begun another attempt to change the Federal Communications Commission's Second Computer Inquiry decision, this one aimed at the decision's provisions on protocol conversion.

Already pending at the commission are petitions from AT&T and the operating companies seeking reconsideration of a ruling last summer (Docket 61-216) that wideband channel interfaces constitute terminal equipment and that carriers must therefore order that equipment through separate subsidiaries or an equivalent alternative.

Bell South, one of the newly created regional holding companies, recently came up with an alternative that appears to be less than equivalent. And independent private branch exchange manufacturers have filed objections to "enhanced" Centrex-CO services that allegedly cross the line established in Computer Decision II between basic and enhanced services.

The latest development consists of petitions filed early this month by AT&T and two regional holding companies, American Information Technology (Ameritech) and U.S. West. They want the FCC to let AT&T and its former subsidiaries perform end-to-end protocol conversion as part of a basic transmission service.

In Computer Decision II, intranetwork protocol conversion is part of a basic service, but conversions involving information that reaches the end user are not. AT&T and the regional holding compa-

See AT&T page 51

ISDN tech building up

All-digital transmission evolving

By Lynn Haber
CW Staff

An integrated services digital network (ISDN) may be more a vision than a reality at the moment, but some pieces of its architecture are already in place.

For instance, AT&T last month announced its Circuit-Switched Digital Capability (CSDC) technology, which will let computers send voice, graphics and data transmissions at high speeds over the same lines that can be used for regular phone calls (CW, Jan. 9).

AT&T's ATS Net 1000, IBM's Information Network, the General Electric Information Services Co. (Geisco) and Tymshare Co. are also part of the evolution toward the all-digital transmission, switching and interfacing of voice, data, video and image applications.

"Some of these nascent ISDNs were in place all along, such as Geisco. Others are brand new — IBM's Information Network — and others are parsed parts of systems such as AT&T's resale network after the divestiture," according to Charles P. Lecht, chairman of Lecht Sciences, Inc., a New York-based creative lab and think tank.

Large-scale evolution

Dixon Doll, president of the DMW Group of Ann Arbor, Mich., said, "What you're really talking about, regarding the buildup of ISDNs, is the phaseout of the analog and the phase-in of the digital. And that's something that's been a very large-scale evolutionary process which began about 10 to 15 years ago."

The fundamental idea behind ISDNs is the notion of building one huge digital network in which a number of technologies are utilized to deliver a combination of dedicated lines, switch services and transaction communications to subscribers.

See ISDN page 51

Study finds ignorance of ISDNs

By Lynn Haber
CW Staff

WELLESLEY, Mass. — Ninety-one percent of data terminal manufacturers don't have a clue about what integrated services digital networks (ISDN) are. And of the 9% of data terminal manufacturers who have heard of ISDNs, none has begun an ISDN product planning strategy, according to a study recently released here.

An ISDN represents the future structure of the current public-switched telephone network. ISDNs combine voice, data, video and other communications services into a single digital link.

The study, "The ISDN Evolution: A Strategic Analysis," prepared by Venture Development Corp., reveals that data terminal manufacturers exhibit the lowest level of awareness pertaining to ISDN standardization activities among future ISDN hardware suppliers.

"Data terminal manufacturers typically follow the lead of manufacturers of equipment to which terminals are attached — and that is computers. They do what everybody else does," said Marc H. Rudov, manager of the communications consulting division at Venture Development.

"I guess they look at their business plans and they must not see anything

See STUDY page 54

Call records polled from multiple sites from CP National/57

An automatic switching device will interface most devices to host/62

Wang DVX enhanced/66

INSIDE

■ Another voice/data integrated workstation has been brought out by Ambi Corp./66

■ Amdahl Corp. announces a network concentrator/57

Orion Software unveils net for System/34, 36, 38

WALTHAM, Mass. — Orion Software, Inc. has introduced Network Orion, a modular family of generalized communications software for the IBM System/34, 36 and 38 user.

According to the vendor, Network Orion combines various methods of communication and types of traffic. The software includes data processing, telemessage (electronic mail) and text transmission. Users of the network can combine text and/or data files with telemessages for transmission to any remote location.

Information can be sent to other IBM System/34, 36 and 38 machines, to word processors from Wang Laboratories, Inc. and IBM and to simple remote data terminals. It also enables information to be sent via external networks.

Regardless of the destination system of networks, the procedures for transmitting information are identical. Through standard menus, the user specifies the information to be sent and addresses it to a location, a department or an individual user. Transmissions can be a free-form message, a word processing document, software and/or records from a data base file.

The intelligence of Network Orion is contained in three modules, the Network Orion Control Facility, the Text and Message Facility and the Remote Data Processing Facility.

The Network Orion Control Facility (NOCF) directs information traffic by reference to a predetermined network configuration. Initially, the network configuration and control rules are defined to NOCF as a series of profiles that detail the locations on the network, the machines connected at each location, authorized users or groups of users, transmission priorities and scheduled transmission events.

The Text and Message Facility (TAMF) provides for office automation facilities such as communication of information as free-form messages typed in at a keyboard, word processed documents, extracts from data base files or a combination. The information can be transmitted in a variety of ways, such as via General Electric Information Services Co.'s Quik-Comm electronic mail, direct dial to other System/34, 36 and 38 computers or word processors or via the Telex network.

The third module, the Remote Data Processing Facility (RDPF), was designed to meet the requirements for distributed data processing, including the transfer of data and program files, spool items, library and source members.

In addition, Remote Job Management allows jobs to be scheduled and executed at remote sites under control of the central site data processing management. Multisystem networks of System/34, 36 and 38 computers can thus update remote fields, perform software maintenance, execute jobs on a scheduled basis at remote sites and receive data from remote sites for consolidation reporting.

The communications options of Network Orion can be extended by adding new communications modules for other devices such as mainframe computers, other network facilities and office automation facilities. These will be made available according to demand and technological development, and the additions require no change to existing Network Orion locations other than the installation of new communications modules.

Typical applications include consolidation of information from several remote locations, the control and transfer of new application programs and procedures, data base updating, order processing between multiple sites, transmission and receipt of day-to-day operational transactions and other company reports, data processing or text-related activities, as well as single- or multiple-site electronic mail creation and transmission.

Network Orion is modularly priced. Licenses begin at $1,900 for a single-site electronic mail capability on a System/34 and 36. The new Network Orion is available for immediate delivery on a System/38.

Orion Software, Suite 300, 400-2 Totten Pond Road, Waltham, Mass. 02154.

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	Current	Future	When?
Operating System			
CPU			
CICS Level			
# CICS Terminals			
IMS Level			
# IMS Terminals			
VM Level			
# VM Terminals			

AT&T from page 49

nies can convert the latter only if they first obtain a waiver from the FCC.

When the Computer Decision II protocol provision was adopted about three years ago, the FCC realized it might require modification and launched an inquiry (Docket 80-756).

FCC decisions

When the investigation was completed last November, the commission decided:

■ The basic protocol conversion policy would not be changed.

■ Conversion of control signals — for example, the dialing pulses used in telephone communication to designate the number of the called party and the address bits attached to data packets — are part of a basic service.

■ All other end-to-end signal conversions constitute enhanced services, but waivers will be granted more quickly and easily for some of these services than for others.

The favored group includes internetwork protocol conversions (X.25 to X.75) and "a change in electrical interface characteristics to facilitate transitional introduction of new technology." One example: the conversion of a digital voice input to an analog voice output.

In their petitions for reconsideration submitted this month, AT&T and the two regional holding companies objected strenuously to continuation of the waiver requirement.

AT&T contended that "an ad hoc waiver process is unworkable, harmful to competition and contrary to the movement toward minimization of regulatory oversight. . . . A carrier . . . cannot . . . invest . . . time, money and other resources in innovative design in the face of fundamental regulatory uncertainty over whether it will be allowed to use the product of its investment."

Waiver requirement

Because of the waiver requirement, AT&T added, carriers would have to reveal their business plans to competitors in advance. AT&T said the commission should "adopt rules permitting AT&T to provide code and protocol conversions on the same unrestricted basis as other carriers."

The three petitioners also said the FCC should:

■ Declare that all protocol conversions now performed within the network are "basic."

■ Allow the carriers to perform internetwork protocol conversions and "conversions of electrical signals incident to changes in transmission media or techniques" on a nonwaiver basis.

ISDN from page 49

"ISDN will consist of different pieces," Dell said. "It will consist of digital local distribution facilities, digital switches [and] digital long-haul services. [Long-haul services will be a mixture of satellite, fiber optics and microwave.]

"And the local distribution facilities or the regional or metropolitan services will be provided using combinations of coaxial cable and fiber and digital termination services. There will also be other technologies like local-area data transmission," Dell explained.

ISDN architecture

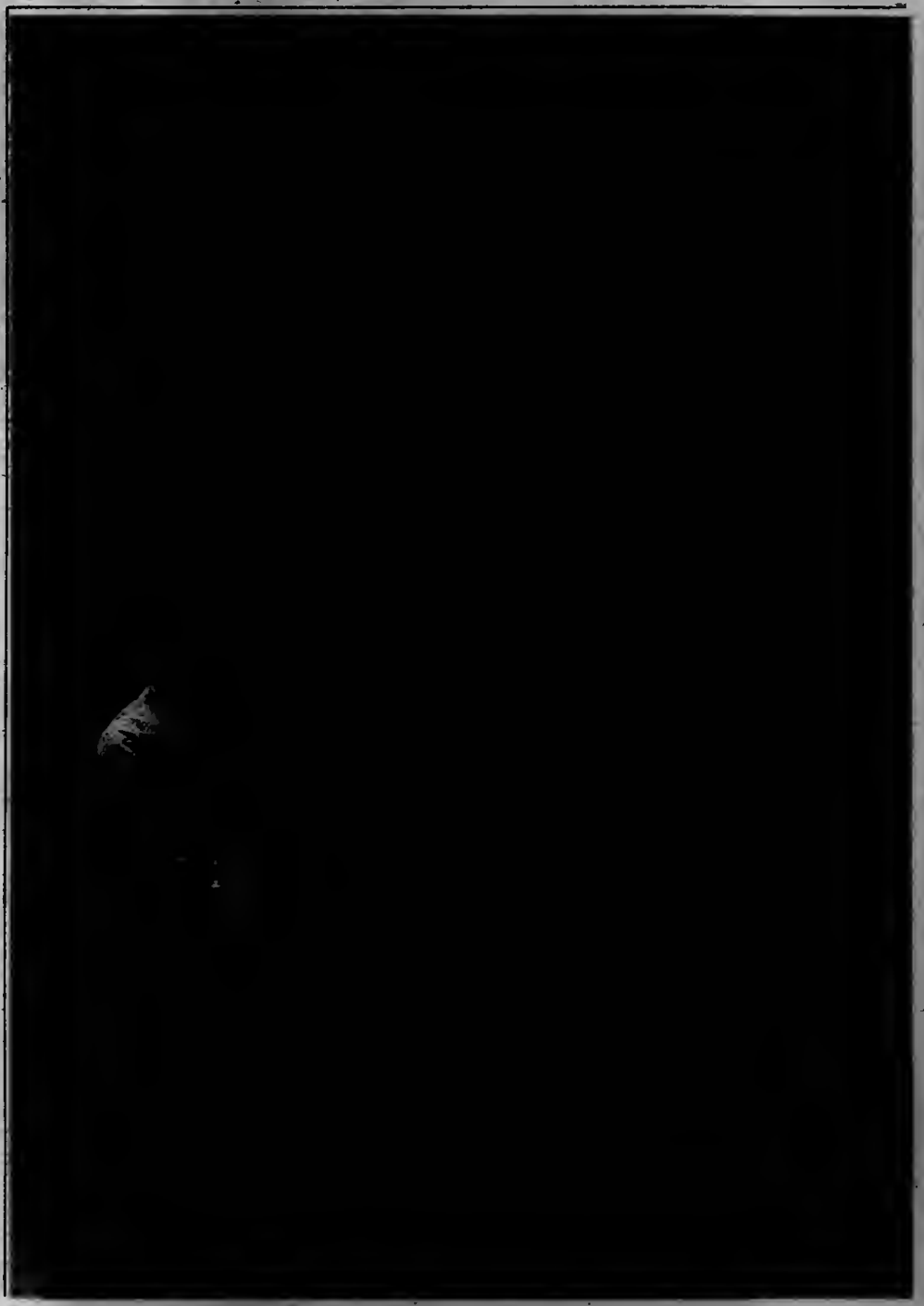
One way to conceptualize ISDN architecture is to think of it in terms of a big computer.

"Think of it as a massive hi-fi set which can handle everything from alarm signals to video signals and everything in between, at varying speeds and volumes. It will allow everything from the simplest sending of a message from point A to point B, to the sending of a whole television show, to doing data processing from the moment the data is received and shipped," Lecht said. "It's a big computer system as well as a massive network."

ISDN is an architecture, not a single system. There are bits and pieces of it in place now and some networks that more or less comply with the provisions of ISDN as it has been defined. "ISDN itself isn't the magic pot of gold at the end of the rainbow," Dell said. "It's a concept that will continue to evolve or change over time. There'll be a little bit more of it every year for as far out as one can see."

While these embryonic

See ISDN page 54



GET EVERYBODY ON BOARD.

Now there's a way to let everyone in your company chip in.

AT&T Information Systems, the company whose unparalleled communications heritage has been bringing people together for 100 years, now brings your office together. With state-of-the-art office automation that's designed to get your company moving ahead.

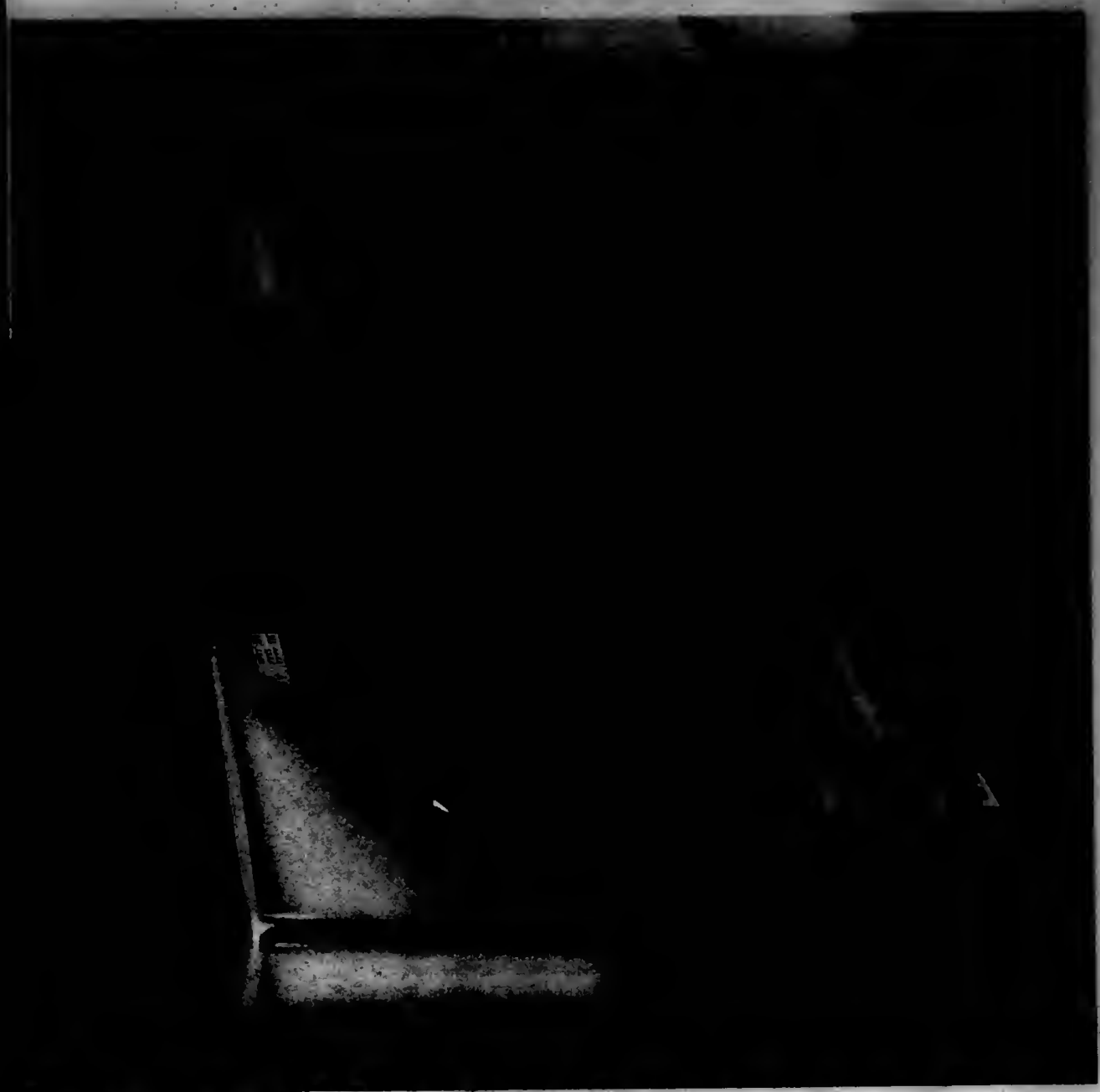
Electronic Document Communications, now available on System 85 and DIMENSION PBX, is an easy-to-learn software application that's hard to beat. Because it integrates your office by letting everyone prepare, send and store documents and messages with the speed and efficiency of a computer. So you can have better access to the right information in the right form at the right time.

Electronic Document Communications can streamline your office in three ways:

Preparing Information—Reduces the time, effort, cost and wasted paper between drafts by electronically creating, editing and formatting documents and messages. "The Composer," a special software feature, checks spelling, grammar, punctuation and usage. EDC even measures whether documents are readable by technical and nontechnical readers.

Moving Information—Speeds documents to many people in different locations simultaneously so they can act decisively. EDC allows you to determine the timing and cost of delivery, and even check to find out when documents were received. Using a password ensures the privacy of your messages.

Managing and Storing Information—Locates documents, and retrieves and evalu-



ates contents quickly and easily with electronic files—while reducing the possibility of losing documents. An electronic "Mailbox" allows you to quickly determine which documents to read first. EDC reduces storing and filing costs with an electronic "Archives" that allows for either short- or long-term storage, and the "Wastebasket" which enables you to permanently delete items after a determined period of time. There's even an electronic "Calendar" that checks personal schedules and arranges mutually convenient meetings.

Not only will all these features help you further integrate your office, Electronic Document Communications is itself just one part of AT&T's line of completely integrated business systems. For state-of-the-art office automation, you can implement EDC in conjunction with other applications software like Message Center/Directory, a call coverage and message system. These office management applications are now available on System 85 and DIMENSION® 600 and 2000 systems with the Applications Processor.

The result is you'll be able to improve staff productivity at every level and get everybody on board. And as new features are developed in the future, they'll be compatible with your existing equipment.

EDC was developed by Bell Labs systems designers who now work for AT&T Information Systems Laboratories. AT&T Western Electric produces EDC, and AT&T Information Systems will maintain it with comprehensive, conscientious service from the largest service organization in the industry. To find out more, call toll-free 1-800-247-1212, Ext. 879M.

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ISDN from page 51

forms of ISDNs presently offer limited ISDN-type capabilities, the future use of a more solidly in-place system has far-reaching capabilities.

"They'll be used the way a computer would be used," Lecht said.

"Only this will be the computer of your dreams. What about a computer that not only distributes into different rooms in different buildings, but also to different cities and countries? You can still think of it as one computer which is in fact a house for other machines — thousands of machines in AT&T's case — so you have the capacity to have computer access and data delivery any place and the power to process in the network [rather than going] into your own data center," Lecht speculated.

"My forecast is that by the end of this decade, maybe 80% to 90% of all data processing in America will be required that way, that the majority of data processing — that is the powers that computer systems give us — will be distributable through networks [and] obtainable through networks, and nothing less than a terminal at the recipient's or deliverer's location is going to be required," according to Lecht.

STUDY from page 49

that's going to affect their business. Perhaps they think that this is so far into the future that they're not going to worry about it now," Rudov continued.

The Consultative Committee on International Telephony and Telegraphy (CCITT) has been developing worldwide ISDN standards during the past four years through a special study group. The CCITT will unveil its ISDN recommendations in Geneva, Switzerland, in November 1984.

Two basic factors

According to the study, the motivations for establishing ISDN standards originated from two basic factors. First, the telephone network — which originally was all analog — has been evolving increasingly into a digital network.

Second, as more corporate data is being routed outside companies' premises, use of the telephone system for data carriage has increased. Therefore, a symbiosis has developed between computing and communicating, and it becomes more logical and economical to combine voice and data into one standardized network — an ISDN.

"There has never been a significant need for data terminal manufacturers to participate in these kinds of standards. They've had to think about RS-232, basically, and that's it," Rudov said. "Now a lot of data terminal manufacturers are starting to incorporate modems inside of their terminals, and the funny thing about that is ISDN will eliminate modems."

According to the report, the significance of this ignorance is that data terminals will be viewed second to telephones as the ubiquitous gateway to ISDN.

Rudov believes this situation may prompt foreign manufacturers to flood U.S. markets with ISDN-compatible terminals, as these manufacturers have been heavily involved in the ISDN standardization process.

The ISDN study is priced at $4,950.

Ventura Development, One Washington St., Wellesley, Mass. 02181.

Now, a major advancement in Net/One local area networking. Lower cost.

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UFO/COBOL is the perfect answer to your procedural on-line programming needs. For the first time, all your COBOL programmers can now develop CICS applications without learning one word of new code. No longer will the lack of specialized Command Level programmers be a barrier to satisfying the growing demand for more on-line applications. Now your present staff can put their ANSI COBOL programming skills to work cutting your backlog of on-line applications...doing it faster, more efficiently, more automatically than ever before.

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An example of UFO/COBOL commands.

In COBOL	In Command level	In UFO/COBOL
DISPLAY (SCREEN-NAME)	EXEC CICS SEND MAP ('XDFHCMA') MAPONLY ERASE END-EXEC.	DISPLAY (SCREEN-NAME)
READ (FILE-NAME)	EXEC CICS READ DATASET ('FILE-NAME') INTO (FILE-NAME) RIDFLD (KEYNUM) END-EXEC.	READ (FILE-NAME)

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In addition to extending the capabilities of your programmers, you'll find that UFO/COBOL is a powerful new method to speed-up the CICS application process dramatically. Built into UFO/COBOL is an interactive screen painting facility that lets you design CICS 3270 screens on-line. UFO/PAINT allows you to build or modify screens without writing one line of code. You design the screen simply by positioning fields where you desire. Then COBOL data descriptions are *automatically* generated from the screen.

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Wang Labs introduces DVX upgrade

LOWELL, Mass. — Wang Laboratories, Inc. has announced the DVX Message Waiting Unit, DVX Feature Package 3.8 software and DVX networking capabilities — enhancements to the company's digital voice exchange (DVX), automated voice communications system.

The message-waiting unit, which sits under the user's telephone, notifies a person called by lighting a message-waiting lamp when a message is deposited in a DVX user's audio mailbox, either internally through DVX or externally by an outside caller, the vendor said. The price is $225.

DVX networking capabilities allow users to access all DVX functions in exchanging messages with individuals on other DVX systems. Software for the first phase of networking is $1,000/node plus a $10/mo license fee for each node.

DVX Feature Package 3.8 software provides users with a facility called Informational Services that allows information to be dispersed by phone to a large audience, regardless of whether or not the inquiry originates with a DVX or non-DVX user, the vendor said.

The information storage capacity of Informational Services consists of nine of the vendor's Voiceline audio mailboxes that hold up to 60 six-minute messages each. All that is needed to access the messages is a standard Touch-Tone-type telephone set, according to the vendor.

The product provides the following capabilities: message confirmation, mailbox scan, on-line directory, play positioning, password modification, 12-digit outbound calling and message purge. The price is $14,000 plus a $140/mo license fee.

Wang, One Industrial Ave., Lowell, Mass. 01851.

NCR Comten announces 4034 console

ST. PAUL, Minn. — NCR Comten, Inc. has announced the 4034 operator console for the company's 3690 data communications system.

The 4034 is available in two models. Model A-5 consists of an 80-character by 24-line CRT with a detached keyboard and an 80-col., dot-matrix, bi-directional impact printer with stand and paper catcher. The printer attaches directly to the CRT, the vendor said. Model B5 comes without a printer and stand.

From the console, the network operator can control any local or remote communications processor in the network, reconfigure the relationship between lines and subchannels without regenerating the system software and execute network-control-program (NCP) line swaps.

The operator can also invoke utilities, traces and commands from the local console for remote nodes in an access-control-field/NCP network, the vendor said. The A-5 model costs $3,650. The B5 model is priced at $1,645.

NCR Comten, 2700 Snelling Ave. N., St. Paul, Minn. 55113.

'Hmmm ... Worst data byte I've seen in a long time.'

Workstation out from Ambi

STAMFORD, Conn. — Ambi Corp. has announced an integrated voice and data executive workstation designed as a desktop, two-line, integrated voice and data private branch exchange (PBX).

The Ambiset reportedly combines telephone features with personal processing capabilities that can be upgraded to include compatibility with IBM and with computers using the Microsoft, Inc. MS-DOS operating system.

The unit is said to look like a business telephone with the addition of a typewriter keyboard and an 80-col. by eight-line display screen. It reportedly can be installed by plugging in to a standard analog RJ11 telephone jack for use on rotary and pulse lines.

It is said to feature 128K bytes of random-access memory (RAM) for general messaging functions; 64K bytes of battery-backed Cmos RAM to support a 250-entry, fast-dial directory; and 48K bytes of erasable programmable read-only memory that is set aside for special function keys.

These special function "learn" keys are designed to allow the user to teach the system how to handle special communications needs, the vendor said.

The suggested retail price is $2,495.

Ambi, 1053 Washington Blvd., Stamford, Conn. 06901.

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COMMUNICATIONS CONTROLLERS

AMDAHL CORP.
4470 Network Concentrator

Amdahl Corp. has announced the 4470 Network Concentrator, a packet-switching product which allows users to communicate with private and public X.25 data networks and computer systems using the industry-standard IBM Systems Network Architecture (SNA). It is an extension of the company's 4400 series of communications products.

The product features single or multiple X.25 links to public data networks. It supports IBM 3274 and 3276 control units and associated printers and keyboard displays with up to seven Synchronous Data Link Control (SDLC) lines, 16 SDLC 3270-type clusters and 128 SNA logical units, the vendor said. The price is $12,500.

Amdahl, 1250 E. Arques Ave., P.O. Box 470, Sunnyvale, Calif. 94086.

VOICE/DATA COMMUNICATIONS

GTE BUSINESS COMMUNICATION SYSTEMS, INC.
Omni SI

GTE Business Communication Systems, Inc. has announced the Omni SI office communication system, an expansion of the company's private branch exchange.

The system can handle up to 256 voice and data ports and is designed to serve businesses with between 20 and 300 employees, the vendor said.

The product utilizes dual-bus architecture — a pulse-code-modulation bus for voice and a packet bus for data. The product is available with specialty designed packages for specific industries such as lodging and health care, the vendor said. The price range is $600 to $700 per line.

GTE Business Communication Systems, 12502 Sunrise Valley Drive, Reston, Va. 22090.

SURE COMMUNICATIONS, INC.
Solution III Telemanager

Sure Communications, Inc. has introduced the Solution III Telemanager, an automated, on-site telemanagement system designed to assist organizations with up to 2,000 extensions.

The system features a microcomputer, hard disk storage and a CRT and utilizes Digital Equipment Corp. hardware, the vendor said.

The product was designed to function in a regular office environment rather than a computer room and is compatible with almost every telephone system and telephone switch, according to the vendor. The price ranges from $40,000 to $45,000.

Sure Communications, 257 Park Ave. S., New York, N.Y. 10010.

CP NATIONAL
Telepat II

CP National's Software and Systems Division has introduced Telepat II, a telephone-traffic data storage system which allows polling of call records from multiple sites for processing on a central IBM mainframe.

The system collects telephone call records from almost any computerized telephone system and records them onto 5¼-in. flexible disks for later polling. It uses the IBM-compatible 3780 Binary Synchronous Communications protocol for polling, with a transmission speed of 1,200 bit/sec, the vendor said.

Processing on an IBM mainframe can be accomplished with the company's Telemanagement Software Systems. The price is $4,900.

CP National, 842 Old New Brunswick Road, Piscataway, N.J. 08854.

MULTIPLEXERS/ MODEMS

TIMEX COMPUTER CORP.
TS2050

Timex Computer Corp. has announced the Timex Sinclair (TS) 2050 telecommunications modem, which allows users of the vendor's computers to use their telephones for services such as electronic mail and home banking and shipping.

The modem, when used with the TS1500 computer, provides an interactive system that can be used to communicate with other computers. The TS2050 is compatible with all Timex Sinclair personal computers and peripherals. It includes a Timex Smart Terminal I software cassette, which enables users to access computer subscription services and computer data bases immediately.

It also comes with modular phone cables and jacks for connection to standard or electronic telephones, a 9V ac adapter and a step-by-step instruction manual.

The TS2050 Telecommunications Modem has a retail price of $119.95.

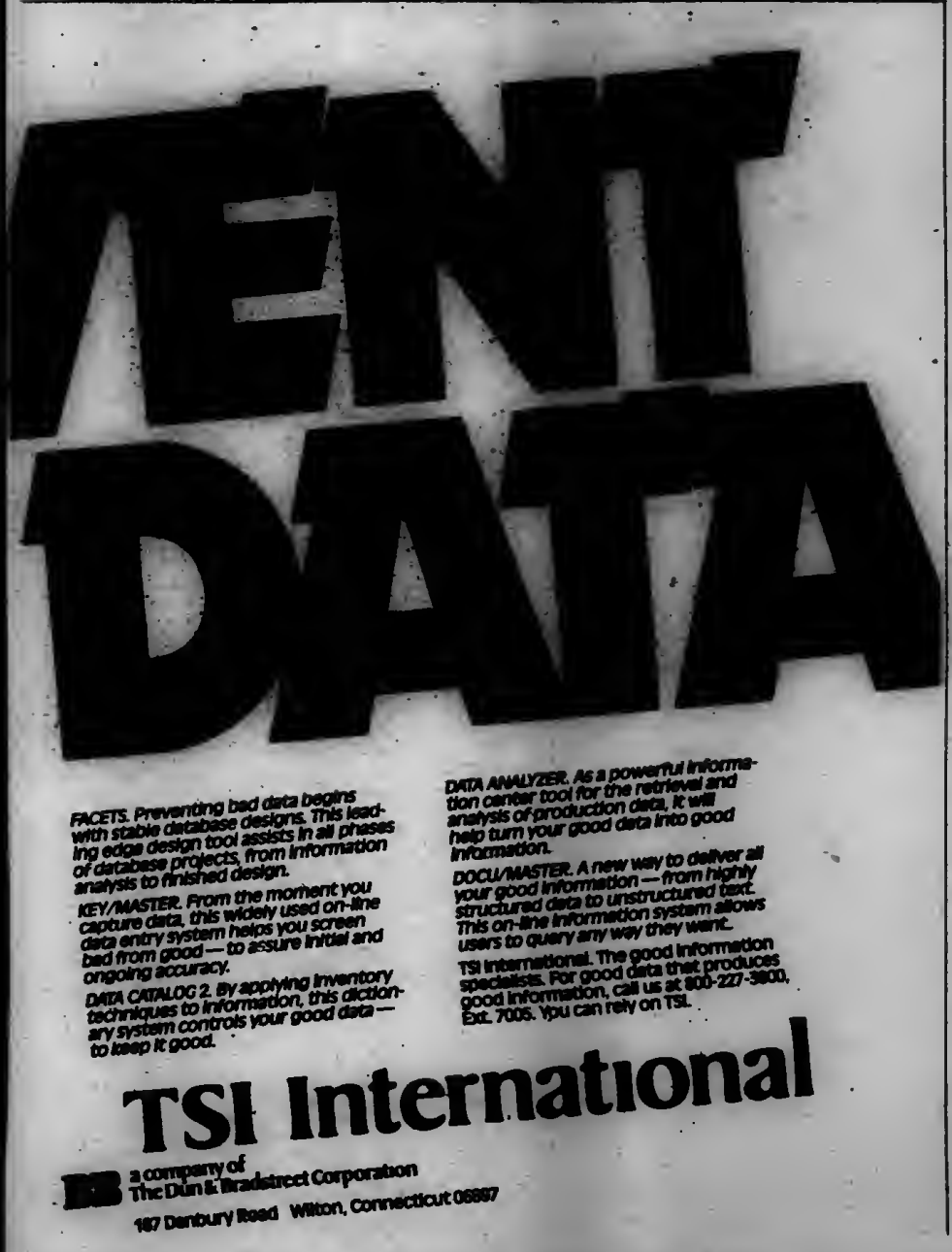
Timex Computer, P.O. Box 2655, Waterbury, Conn. 06725.

GENERAL DATACOMM INDUSTRIES, INC.
4800S; 2128S

General Datacomm Industries, Inc. has introduced two modems, the 4800S and the 2128S Super Saver.

The 4800S is a switched network, key-featured, single card modem. It features asynchronous or synchronous operation with autodialing and automatic request-to-send, clear-to-send delay.

Continued on page 59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FACETS. Preventing bad data begins with stable database designs. This leading edge design tool assists in all phases of database projects, from information analysis to finished design.
KEY/MASTER. From the moment you capture data, this widely used on-line data entry system helps you screen bad from good — to assure initial and ongoing accuracy.
DATA CATALOG 2. By applying inventory techniques to information, this dictionary system controls your good data — to keep it good.
DATA ANALYZER. As a powerful information center tool for the retrieval and analysis of production data, it will help turn your good data into good information.
DOCU/MASTER. A new way to deliver all your good information — from highly structured data to unstructured text. This on-line information system allows users to query any way they want.
TSI International. The good information specialists. For good data that produces good information, call us at 800-227-3800, Ext. 7005. You can rely on TSI.
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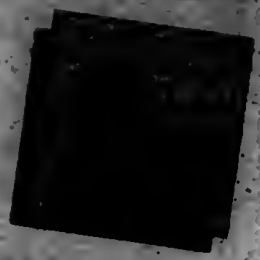
The Goal News

For VSAM Dataset Management

AUTOMATIC BEATS MANUAL



VSAMAID/XP™ Slashes Man-Hours From VSAM Management

Goal Systems International has developed a product called VSAMAID/XP which makes virtually any systems person a VSAM expert. Data processing managers everywhere know that when VSAM is running, it is necessary to continually tune the system in order to keep response times within acceptable limits. Before VSAMAID/XP, that job required highly specialised technicians working full time to manually keep disk utilization and CPU overhead to a minimum.

VSAMAID/XP changes all that. The system eliminates the inefficiencies of VSAM and automates the tuning of VSAM files.

A historical file of all VSAM data sets in DOS/VSE, OS/VS1 and MVS is created from VSAM performance data. Then, as required, vital statistics are generated through VSAMAID/XP's Recommendations Processor, Device Capacity Processor or History File Trends Processor. Working through mathematical algorithms, VSAMAID/XP will tell you exactly how to best tune your system for your VSAM files. If you wish to see how altering various factors will change your efficiency, there is a modeling system built into VSAMAID/XP for that purpose.

Product Of New Software Technology

Calling on its highly skilled software development team, Goal Systems International began research on VSAMAID/XP in mid-1981. The system required the experience of telecommunications software experts, mathematicians, and skilled programmers to produce. "The challenge," a spokesman said, "was to make the system do all the work, yet allow the user to maintain control over a wide variety of VSAM data."

Some of the VSAM factors VSAMAID/XP handles include variable selection for key sequenced files, the use of free-space values, VSAM default parameters, allocation of virtual storage, records organization, most common access patterns, and more.

VSAMAID/XP makes its recommendations in the IDCAMS DEFINE format to simplify redefining each file.

Over 200 Systems On Trial in First Three Months

Named as the most popular product in the history of Goal Systems, VSAMAID/XP has been shipped to more than 200 sites for trial in its first three months of availability.

Works With FAVER/XP™ For Total VSAM Management

Goal Systems International has revealed that they have an interface between the FAVER/XP Backup & Restore system and the VSAMAID/XP system which creates the only complete VSAM dataset management system available today.

During backup, the FAVER/XP special interface creates a historical file, which is used by VSAMAID/XP to create a "recommendations" report. The report tells resource managers how to manage VSAM datasets for optimum space allocation and resource utilization. VSAMAID/XP recommendations may then be implemented with simple commands through the FAVER/XP Auto-Delete/Define facility.

"It seems like all we have to do is mention VSAM and people are eager to listen," said Danny Post, Sales Manager for the XP Product Line. "But then, installations are only ever realizing that a great deal of manual labor is spent keeping VSAM files tuned. VSAMAID/XP can be installed in a few minutes; it [illegible] its first recommendations [illegible] one week of gathering your [illegible] data. [illegible] delighted with [illegible]

VSAMAID/XP and FAVER/XP are great news for installations with VSAM. They are two of the Extended Productivity Systems from Goal Systems International. Both are available for a free trial. Call Goal Systems toll free today.

800-848-4640 (In Ohio, 800-628-4640)

Goal Systems

Software Solutions

Goal Systems International Inc.
5455 N. High Street
Columbus, Ohio 43214-1183
Phone (614) 888-1775

COMMUNICATIONS

Continued from page 87

The 4900S is available in a compact stand-alone enclosure or high-density rack-mount shelf that houses 16 modems.

The vendor's other new product is the 2123S Super Saver modem, an asynchronous, full-duplex modem designed for switched network operation. It is compatible with Bell 103, 113 and 212-type modems and allows any RS-232C-compatible asynchronous terminal to communicate with any other computer and a Bell 212-compatible modem.

According to the vendor, the 2123S has a digital adaptive equalizer that provides greater tolerance to telephone line impairments often found on the switched network. The list price of the 4900S is $1,645; the 2123S costs $455.

General Datacomm Industries, One Kennedy Ave., Danbury, Conn. 06810.

C-COR ELECTRONICS, INC.
Model 7140 modem

C-Cor Electronics, Inc. has announced the Model 7140 Synchronous Data Modem which operates at speeds up to 9.6K bit/sec.

The product is an extension of the company's Cableport 7100 Series Narrowband Modems for two-way broadband coaxial network applications.

The Model 7120 Voice Modem offers audio response up to 10 kHz for off-premises extension and bypass telephone applications. The Model 7120 provides medium-speed data transmission up to 19.2K bit/sec. All models operate in simplex, half-duplex and full-duplex modes, the vendor said. The prices are $675 for the 7120 Voice Modem, $625 for the 7130 Asynchronous Modem and $650 for the 7140 Synchronous Data Modem.

C-Cor Electronics, 60 Decibel Road, State College, Pa. 16801.

NOVATION, INC.
Access 1-2-3 package

Novation, Inc. has bundled its PC1200B smart modem with Crosstalk XVI from Microstuf, Inc., to create a data communications package for the IBM Personal Computer, Personal Computer XT and compatibles.

The system includes a modem, software and documentation and is part of Novation's communications system called Access 1-2-3. The modem is capable of full-duplex operation at either 300 or 1,200 bit/sec and can perform an automatic self-test and receiver alignment at power-on and can be put into analog or digital loop-back test modes, the vendor said.

The software package for the IBM Personal Computer is an intelligent terminal employing all the features of the modem to accomplish autodial, autologon and autoanswer and allows for disk-to-disk data transfer, according to the vendor. The price of the package is $595.

Novation, 20409 Prairie St., Chatsworth, Calif. 91311.

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COMMUNICATIONS

TEST EQUIPMENT

B & B ELECTRONICS
Mini Tester Model 232MT

B & B Electronics has introduced the Mini Tester Model 232MT, a smaller version of the company's RS-232 Tester.

The Mini Tester features one male and one female connector for insertion into any RS-232 interface. Twenty-five pins are connected straight through, with seven lines connected to LEDs, which indicate the status of transmission data, receive data, request to send, clear to send, data set ready, carrier detect and data terminal ready, the vendor said.

The product measures 2¼ by 2¼ by ¾ in. and is available with two-color LED. Red and green LED can indicate a low, high or open condition.

The Mini Tester is priced at $49.95; with two-color LED, it costs $59.95.

B & B Electronics, Box 475, Mendota, Ill. 61342.

HEWLETT-PACKARD CO.
HP 4945A Tims

Hewlett-Packard Co. has announced a transmission impairment measuring set (Tims), designed for problem isolation on high-speed, data- and voice-grade circuits.

The HP 4945A Tims reportedly combines a comprehensive measurement set, a wideband frequency range, convenient display formats, programmability and hard-copy capability through multiple I/O and remote testing capability.

The HP master/slave technique is said to increase productivity with one-person, two-way testing by allowing the local master set to control a remote slave set with automatic control and collection of slave functions and measurements.

The company offers delivery in eight to 12 weeks after receipt of order. The HP 4945A Tims is priced at $14,950.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

DOLCH LOGIC INSTRUMENTS, INC.
SIP 80E

Dolch Logic Instruments, Inc. has introduced a serial interface probe that configures the front end of a logic analyzer for analysis of asynchronous V.24/V.28 RS-232 serial data.

The SIP 80E probe is available for use with the company's 4950A and 64300 logic analyzers. The probe connects into a serial communications link through standard RS-232C, 25-pin D connectors, according to the vendor.

Features of the probe include capabilities to monitor a serial link's send and receive lines simultaneously or individually and to transmit any selectable Ascii characters on those lines.

It accommodates data rates to 19.2K bit/sec, has a built-in clock burst generator for triggering on the first incoming character and maintains the timing relationships on the logic analyzer's screen by writing blank characters for unchanging and invalid characters. The price is $1,300.

Dolch Logic Instruments, 3053 Orchard Drive, San Jose, Calif. 95134.

AUXILIARY EQUIPMENT

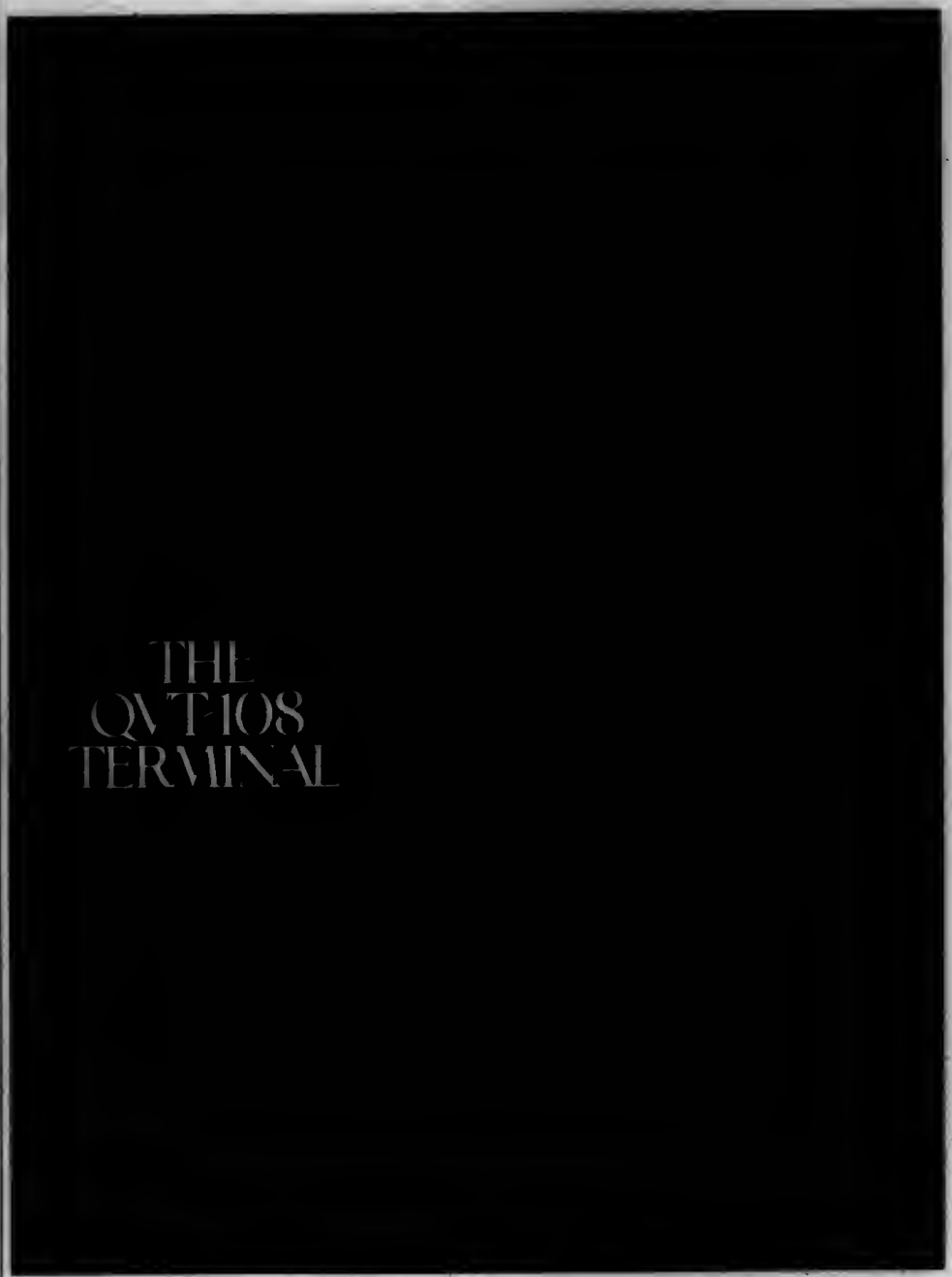
SATELLITE SEMINARS
Tele-Update '84

Satellite Seminars has announced a teleconference designed to inform major telecommunications users of current regulatory and technological changes and of their potential impact on rates and service options.

Scheduled for Feb. 9, Tele-Update '84 will be televised from Bizner, the U.S. Chamber of Commerce facility in Washington, D.C.

According to the vendor, key individuals, agencies and regulatory and technological developments will be featured in a four-hour program, which will also include background and identification of issues, discussion of bills still before Congress, court settlement provisions and other topics of interest to telecommunications users and associations.

The program will be broadcast to at least 25 downlink facilities at universities, hotels and other meeting sites in major metropoli-



COMMUNICATIONS

tan areas across the country. The registration fee for the teleconference is $75 in advance or $85 at the door.

Satellite Seminars, Box 356, Salt Lake City, Utah 84110.

DIGITAL MICROSYSTEMS, INC.
Self-study course

Digital Microsystems, Inc. has added a self-study course for its Digital Research, Inc. CP/M, local-area network, manufacturing resource planning (MRP) system.

The system includes five workstations, 46M bytes of hard disk storage and networking and office automation software. The office automation software includes Perfect Software, Inc.'s Perfect Writer, Perfect Calc, Perfect Speller, Perfect Filer and an electronic mail system.

The MRP software includes material processing, sales order management, master scheduling, inventory control, work order processing, purchasing, inventory, shop floor control and job costing functions. The self-study course is a 14-unit course developed by Boorkin-Arnold Enterprises, manufacturing training consultants.

In addition to the self-study materials, Digital Microsystems provides its customers with a one-day class concerning the office automation software and a one-day training session for the networking and MRP software. An MRP system costs $30,000.

Digital Microsystems, 1755 Embarcadero, Oakland, Calif. 94606.

HADAX PRODUCTS, INC.
PC-Mate

Hadax Products, Inc. has announced the PC-Mate series of data switches. The series includes two push-button switches, each with an input panel connector, plus two output connectors mounted on 6-ft-long ribbon cables.

One switch has a 36-pin/25-lead switched interface for parallel printers, and one has a 24-lead switched D-25/RS-232 interface for serial printers, the vendor said. The price is $99.

Hadax Products, 79 Hazel St., Glen Cove, N.Y. 11542.

COMPUTER APPLICATION SERVICES, INC.
Electronic Mail System

Computer Application Services, Inc. has introduced Electronic Mail System (EMS), a device that reportedly connects IBM mainframe computers running on either OS or DOS directly into Western Union Corp.'s Easylink. Easylink, in turn, supports such sites as TWX, Telex I and Worldwide Telex.

Easylink features automatic dialing and sign-on, transmittal of messages from EMS, inquiry of messages from Western Union and the distribution of Easylink messages to EMS mainframe users at IBM CICS terminals.

Typical users of the Easylink connection of EMS, according to the vendor, are purchasing departments who use it to send orders and sales departments who use it to send shipping confirmations.

EMS is a full-featured electronic mail system for IBM 3270 terminal networks running CICS. The system includes message forwarding, full screen message editing, route lists, tickler files, to-do lists and calendaring.

EMS is offered for $8,900 for the OS version and $7,500 for the DOS version. There is currently no separate charge for the Easylink connection.

Computer Application Services, Suite 210, 12535 Seal Beach Blvd., Seal Beach, Calif. 90740.

GILTRONIX, INC.
9000 series DCU; Selecto-Switch

Giltronix, Inc. has announced the 9000 series Distributed Control Unit (DCU), an automatic switching device for computer interfacing.

The DCU allows communications to be established between any device connected to one of the DCU ports. The product's automatic switching unit allows keyboard-controlled selection of peripherals and computer systems.

Prices range from $500 to $847.

The company has also introduced a Selecto-Switch system for the IBM Personal

Continued on page 68

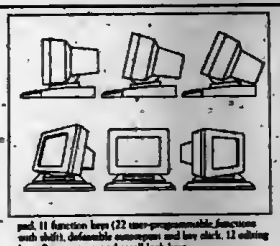
QVT-108
The Great Emulator.

Qume's new QVT108+ VDU terminal emulates Televideo models 925® 920® and 912® making it a perfect fit for operators fatuliar with any of these terminals. It more than matches the Televideo 925 with sophisticated features like 11 function keys, 22 user-programmable functions, 12 editing functions, 25th status line, a menu set-up mode, two full pages of screen memory, and many other standard features.

The QVT108 takes up minimal workspace, and operators will love its ergonomic design: a non-glare green or amber screen with full tilt and swivel, a big 9 x 12 dot matrix for each character to minimize eyestrain, and a detached, low-profile, adjustable-tilt keyboard.

Engineered and built to Qume's exceptional reliability standards, the QVT108 is backed by our six-month warranty and a nationwide service network. Features include:

• Local or duplex editing • 11 function keys (22 user-programmable functions total) • Bidirectional auxiliary port • Two pages of screen memory • Line drawing graphics character set • Tilt/swivel, non-glare, green screen (amber optional) • 9 x 12 character cell resolution, 7 x 9 character size • Detached, low-profile, adjustable-tilt typewriter style keyboard with numeric pad • 24 lines x 80 characters with a 25th status (defeatable)/menu/user-programmable line • Screen-saver time out (an inactive terminal shuts off its screen after fifteen minutes with no screen data loss) • 6 video attributes: blink, blank, normal video, reverse video, underline, and half-intensity • Televideo model 925 code compatible • Emulations: Televideo 925 and 912/920 • Self test • Time of day • Monitor mode • Switching power supply (efficient operation and low power consumption)



Display Format
24 lines x 80 characters
25th status/set-up/user-programmable line
Character Formation
7 x 9 matrix on a 9 x 12 cell
Display Character Set
96 ASCII characters, 32 control character symbols, and 15 graphic symbols
Editing (Local and Duplex)
Cursor up, down, left, right home. Character/line insert and delete, erase to end of line/page. tab. back tab, clear/set tabs
Communications Interface
EIA RS232-C, optional current loop (active or passive)
Communications Protocols
DTR and/or XON/XOFF
Communications Modes
Full or half duplex; block line or block page. 7 or 8 data bits
Baud Rates
16 selections from 50 to 19.2K
Auxiliary Port
Bidirectional. Modes: parallel, transparent, screen copy
EIA RS232-C
Screen
Tilt/swivel, 12-inch diagonal, non-glare green (optional non-glare amber, 14-inch screen)
Character Attributes
Blink, blank, normal video, reverse video, underline, half intensity
Keyboard
Detached, adjustable-tilt, low-profile (home row 30mm from work surface), alphanumeric keys, 14-key numeric pad, 11 function keys (22 user-programmable functions with shift), defeatable numeric pad and key click, 12 editing keys. Print, set-up, and scroll lock keys.
Fields
Protected and unprotected.
Parity
Odd, even, mark, space, none
Screen-Saver
Screen shuts off after 15 minutes of inactivity without data loss (defeatable)
Screen Memory
Two pages
Set-Up Mode
Menu-style password in non-volatile memory (lithium battery with 7-year life)
Power Supply
Switching-type (low power consumption)
Options
Amber screen
14" screen
20mA current loop
Special character sets
Command Set
Televideo 925 compatible
Emulations
Televideo 925
Televideo 912/920
Power Requirements
95-125 VAC
180-264 VAC
50/60Hz, 30W
Dimensions
Keyboard 1 5"(H) x 18"(W) x 8"(D)
Display 14"(H) x 13"(W) x 12"(D)
Weight
Keyboard 3 lbs., display 19 lbs.

Command Codes	
Address cursor, row, column	ESC = r+32 c+32
Address cursor, page, row, column	ESC - p r+32 c+32
Auto page on	ESC ^
Auto page off	ESC w
Back tab	ESC I
Bell	CTRL/G
Block mode on	ESC B
Transparent print on	ESC]
Transparent print off	ESC a
Carriage return	CTRL/M
Character delete	ESC W
Character insert	ESC Q
Clear all column tabs	ESC 3
Clear all to half intensity block characters	ESC . . .
Clear all to nulls	ESC @
Clear column tab	ESC 2
Clear unwanted to blank characters	ESC) or CTRL Z or ESC + ESC ;
Clear unprotected to nulls	ESC C
Conversation mode	ESC (&
Copy print mode on – aux port	ESC A
Copy print mode off – aux port	CTRL/V
Cursor down	CTRL/A
Cursor home	CTRL/H
Cursor left	CTRL/L
Cursor right	CTRL/K
Cursor up	CTRL/T
Disable bidirectional port	CTRL/N
Disable XON/XOFF control	ESC h
Disable status line	ESC g
Display user line	ESC]
Display tabs on	CTRL/R
Enable bidirectional port	CTRL/O
Enable XON/XOFF control	ESC T
Erase to BOL with blanks	ESC Y
Erase to EOP with blanks	ESC)
Field tab	ESC (
Keyclick off	ESC -
Keyclick on	ESC R
Line delete	CTRL/J
Linefeed	ESC E
Line insert	ESC f (next) CR
Load user line	ESC k
Local edit on	ESC @
Lock keyboard	ESC n or ESC L
Monitor mode off	ESC U
Monitor mode on	ESC K
New page	CTRL/_
Normal video	ESC d
Previous page	ESC [
Print page	ESC P
Protect mode off	ESC '
Protect mode on	ESC &
Read cursor, page, row, column	ESC /
Read cursor, row, column	ESC ?
Reverse video	ESC b
Reverse linefeed	ESC j
Screen, blank	ESC o
Screen, normal	ESC n
Select termination character	ESC = (char)
Send line all	ESC 4
Send line unprotected only	ESC 6
Send message all	ESC 1
Send message unprotected	ESC 5
Send page all	ESC 2
Send page unprotected only	ESC 5
Set column tab	ESC 1
Set cursor attributes	ESC G (n)
Set printer termination character	ESC (char)
Set video attribute	ESC G (n)
Tab	CTRL/I
Unlock keyboard	ESC "
Half intensity off	ESC)
Half intensity on	ESC (
Load user line (to status line)	ESC ap 1 (n) (n) (n)
Read user line	ESC ap 2
Special graphics off	ESC %
Special graphics on	ESC %

*Defeatable and Televideo 925, 912, and 913 are registered trademarks of Televideo Systems, Inc.

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With a remarkably simple solution. The Sperry PC.

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SPERRY PERSONAL COMPUTER SPECIFICATIONS

OPERATING SYSTEM	MS DOS Version 1.25 or 2.0 with G.W. BASIC
MICRO-PROCESSOR	High-Speed 16-bit 8088
DISPLAY SCREENS	High Definition monochrome display. High resolution color display. IBM compatible graphics.
COMMUNICATIONS	Built-in Asynchronous
KEYBOARD	84 keys. 8 ft. curl
AUXILIARY MEMORY	Up to two internal 5¼" diskettes. 10MB internal fixed disk when configured with single diskette.
USER MEMORY	Standard 128K bytes, expandable to 640K
DIAGNOSTICS	Power-on self test
CLOCK	Time-of-day with battery back-up

SPERRY

The Sperry PC. What the personal computer should have been in the first place.

Advt. No. 100-83-5223—PHCB

Prepared by LEWIS, GILMAN & KYNETT, INC., Philadelphia.

COMMUNICATIONS

Continued from page 61

Computer, which eliminates the need for plugging and unplugging of cables connecting such peripherals as printers, plotters, terminals and modems to various computers, the vendor said. The system is available in more than 10 models. Prices range from $110 to $300.

Gilbreath, 3750 Fabian Way, Palo Alto, Calif. 94303.

XYPLEX, INC.
XP-UN32-A

Xyplex, Inc. has announced the XP-UN32-A, a host interface unit for the company's networking system.

The product is a 32-port version of the vendor's Digital Equipment Corp. Unibus host interface unit. The Xyplex system converts the terminal subsystem of DEC's VAX-11 minicomputer from a character-at-a-time system to an intelligent message processor. It provides the VAX/VMS system with equivalent capabilities of the IBM 3270 terminal family, the vendor said.

The unit provides a single-board interface for up to 32 or 64 ports via a single coaxial cable into a VAX computer system. The system supports up to 255 host interface units and cluster controllers connected to a single coaxial cable, which can be up to six miles in length, the vendor said. Unit price is $5,700.

Xyplex, 100 Domino Drive, Concord, Mass. 01742

ATTACHMATE CORP.
3270 Coax Interface

Attachmate Corp. has announced the 3270 Coax Interface, said to allow IBM Personal Computers to function as new IBM 3270 Personal Computers with more features and enhanced performance.

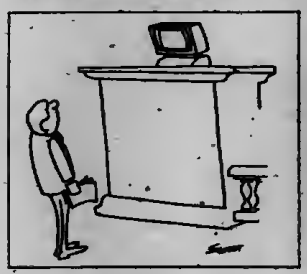
The 3270 Coax Interface adds Personal Computer-to-mainframe windows to IBM Personal Computers and their counterparts. When connected to mainframes, Personal Computers with the Attachmate 3270 can be transformed into as many as four terminals, the vendor said. The product can function with up to seven distinct programs, displaying each one in a separate screen window.

A lock and key secure access to the mainframe, the vendor said. A Personal Computer memory is not used, and 256K-byte capacity is an option on the board, the vendor said. The Attachmate 3270 Coax Interface costs $910.

Attachmate, 3241 116th S.E., Bellevue, Wash. 98005.

K-SYSTEMS, INC.
KTL-100

K-Systems, Inc. has introduced the KTL-100, a printed-circuit module that emulates Digital Equipment Corp.'s VT100 CRT terminal.



A dual-height board provides two full-duplex, serial asynchronous channels for keyboard and computer interface and an RS170 composite video output for a monitor. Installed into a standard DEC backplane or equivalent power source, the module implements the vendor's Advanced Video Option, including 80 and 132 columns, nonvolatile setup parameters and all display attributes, the vendor said. Its unit price is $600.

K-Systems, 3802 Lilac, Las Cruces, N.M. 88005.

TYMNET, INC.
Asynchronous Terminal Concentrator

Tymnet, Inc. has announced the Asynchronous Terminal Concentrator (ATC) for users to access its public and private packet data communications networks. The product reportedly serves up to eight simultaneous users.

The ATC measures 12 in. wide by 3 in. high by 12 in. deep. It performs automatic, independent speed detection in a range from 110 to 9,600 bit/sec. Integrated into the ATC is a set of hardware diagnostics, including communications and remote reporting software for both terminal and network connections, the vendor said. The price is $3,300.

Tymnet, 2710 Orchard Pkwy., San Jose, Calif. 95134.

DATA COMMUNICATIONS BROKERS, INC.
"Modem Options"

Data Communications Brokers, Inc. has introduced a videotape to be included in its training series.

"Modem Options" deals with the variety of modems on the market. The color videotape demonstrates what each modem option does and how it is used in various applications. Some modem options include constant carrier, switch carrier, receiver sensitivity level, equalization, automatic vs. manual answering and leased line vs. dial-up, the vendor said.

The videotape is available in ½-in. Betamax or VHS and ¾-in. U-Matic formats. Two-week rental is $40 for ½-in. and $60 for ¾-in. tapes. Tapes may also be purchased for $150 (½-in.) or $180 (¾-in.).

Data Communications Brokers, 3000 Research Road, Champaign, Ill. 61821.

HUGHES

Since you'll be spending millions of dollars per month on data communications networks, you want all the information you can get. Right?

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Just wait for your February 27th issue of **Computerworld.** Then read the special report on Data Communications Networks from cover to cover. You'll get it all:

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- *private branch exchange (PBX) networks*
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If you spend — or are planning to spend — millions on data communications networks, then you can't afford to miss the February 27th special report on Data Communications Networks in **Computerworld.**

And, if you've got product or service ads that will help our readers make informed choices for 1984 — then you need to get your ad to us by February 10th. To reserve space in the February 27th issue, call one of the sales offices listed below, or call Ed Marecki, National Sales Director.

To: Ed Marecki, *National Sales Director*
CW Communications/Inc., Box 880, Framingham, MA 01701

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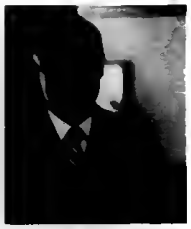
Cullinet

on Cullinet's New Software Products



John Cullinane *founded Cullinet Software in 1968, with the, then revolutionary, idea of specializing in computer software products. Since that time, Cullinet has become the most successful and respected software products company in the world and the first such company to be listed on the New York Stock Exchange. John has always been committed to the concept of a user driven company, where success is measured by the success of the users of Cullinet products.*

As a tribute to Cullinet's success, John was elected CEO of the Year in the software industry in 1982. He is a graduate and Trustee of Northeastern University and Chairman of the Advisory Committee of its College of Computer Science.

"On April 19, 1983 Cullinet made a number of significant new product announcements. Since that date, these products have generated much interest and related discussion in the industry, in the trade press and at technical forums. The purpose of this brochure is to put these products in perspective for the reader. At the same time, the brochure highlights some of the key members of Cullinet's outstanding technical staff responsible for the design and development of these products. During the past decade, with products and people like these, Cullinet has continually achieved significant advances in the state of the art of software technology."

What is

IDMS/R?

Ed Savoie is Cullinet's Manager of Database System Software development. He joined Cullinet five years ago and has made important contributions to the development of IDMS. Today, Ed is responsible for the development of IDMS/R, the Integrated Data Dictionary and IDMS/DC. Ed is a graduate of Harvard University where he majored in Psychology.

Thomas Nelson, Director of Software Design and Integration, has contributed to most of the important technical accomplishments of Cullinet Software products for ten years, these include the IDMS Central Version, Distributed Database System and the Universal Communication Facility. He is a key figure in the design of both IDMS/R and the Information Database. Tom is a graduate of Massachusetts Institute of Technology.

IDMS/R is not only a relational database management system, but a particularly powerful one. IDMS was made relational by removing all pointers and allowing the user to define data as tables and providing the traditional relational operators such as selects, projects and joins. In other words, IDMS/R will more than satisfy the relational purist. The major benefit of any relational DBMS is the capacity to develop applications faster because the developer does not have to be concerned with the database design. IDMS/R provides this and much more.

For example, the Automatic Systems Facility (ASF) of IDMS/R is a major advance over fourth generation languages. ASF is so comprehensive and easy to use that all a user need do to develop an application is to define a relational record. Then the Automatic Systems Facility dynamically generates all necessary supporting structures including data definitions, screen formats, application processing logic, and documentation. In other words, the developer can witness the application being produced, literally, in seconds. Thus IDMS/R is the perfect system for the end user.

But suppose when you build a complex, high volume production application with IDMS/R, you desire high performance. Typically 5% of the data relationships (joins) in any application are accessed 95% of the time. With IDMS/R you can simply change these relationships to predefined joins and benefit from a dramatic boost in performance. We call it Relational Fastpath. This is what makes IDMS/R a unique relational DBMS, and a perfect system with which to build production applications. In addition, IDMS/R has the most sophisticated back-up and recovery capability of any DBMS, an absolute must for on-line applications.

In summary, IDMS/R was designed to satisfy the requirements of those who want to develop both production and end user applications faster and those who have the responsibility of processing them.

What is

The Information Database?

Don Heitzmann *is Cullinet's Director of System Software Development. Don joined Cullinet seven years ago. His early efforts were in design and development of IDMS/DC and he is now responsible for the complete IDMS database product line. Don is a graduate of Princeton University with a B.S. in Electrical Engineering and a Masters in Architecture.*

Ernie Peabody *is Cullinet's Project Leader for development of the Information Database. Ernie is uniquely qualified since he has experience in mainframe and personal computer processing and communications. Ernie holds a degree in Mathematics from the University of Kansas and a Masters in Computer Science from Georgia Tech.*

The Information Database is an extremely exciting product for those organizations who have studied it. They understand how important it is to the success of the Information Center concept and effective use of personal computers in their organization.

The Information Database is the critical link between an organization's data residing in databases or files located in the company, or in outside databanks, and personal computer users. While PC users can access an IDMS/R database directly, we believe that a typical company would prefer that their PC user community access a specialized database, containing pertinent information summarized from appropriate sources, rather than directly from production data.

The Information Database works this way: selected data (information) is automatically fed from IDMS/R eliminating duplication of data while ensuring timely and accurate information. Utilities are provided to feed the Information Database from various databases and files, including IMS and VSAM. The Information Database is the intelligent link because the PC users can get the information they need, without having to master mainframe systems. Facilities built into the Information Database and Cullinet PC software make this possible. The Information Database appears as a new directory on the PC, so users can move information down to the PC or up to the mainframe without having to learn a new language. As a result, the user can store a private database in the Information Database and make it available to other PC users. Sophisticated security techniques insure privacy where appropriate, while allowing sharing of information when desired.

This is why the Information Database is so important. It is the intelligent link between the PC and the mainframe and is a must for any company considering significant use of personal computers.

What About

Cullinet's PC Software?

Mary Kroening *is Manager of Cullinet's Personal Computer development project. She joined Cullinet in 1982, when Computer Pictures was acquired by Cullinet. Mary's experience in microcomputer software has been a key factor in accelerating Cullinet's entry into the personal computer field. Mary attended the University of California at San Diego where she worked on the UCSD Pascal system and the University of California at Berkeley where she majored in Computer Science.*

Dave Litwack *is Cullinet's Vice President of Product Development. Dave oversees all Cullinet software development activities for the company. Previously Dave held key roles in Cullinet's entry into Applications Software and in the development of the Application Development System Online. Dave joined Cullinet in 1976. He is a Cum Laude graduate of Brandeis University and holds a Masters in Computer Science from Boston University.*

The lack of an integrated software solution has existed on the personal computer just as it once did on the mainframe. The size of the computers may be different but the problems have been the same. Cullinet derived its initial success by pioneering the concept of a comprehensive and integrated software solution to the mainframe users' requirements. We have applied this same philosophy to the personal computer. As a result, Cullinet's PC software includes all the capabilities needed by the user including: spreadsheet, financial modeling, document processing, electronic mail, relational database, graphics and information management. Individually these components compare favorably with their respective equivalents on the market, but collectively Cullinet offers a unique capability to its PC software customers, namely a comprehensive and integrated solution.

However, we don't stop there. We have developed a very sophisticated and intelligent interconnection with the mainframe via Cullinet's Information Database and PC software. This connection allows the use of reports, graphs, spreadsheets and relational data tables stored on the mainframe as if they resided on the PC disk. The intelligent link enables the database to process user queries and updates regardless of the location of the data. The resulting information can be used as input for spreadsheets, or to create graphs and documents. This entire process of retrieval, analysis and presentation can be automated, and the results shared with other users via the Information Database.

The Cullinet PC software combined with the Information Database provides the solution to corporate information problems. We make it possible to organize corporate and personal data, regulate access to it, and provide the end-user with the tools they need to analyze and understand that information to make sound business decisions.

What About

Cullinet's Applications?

Fred Buckley *is Cullinet's Manager of Manufacturing Applications Software Development. His efforts have been crucial in achieving the integration that makes Cullinet's manufacturing system unique. Fred joined Cullinet in 1977. Fred holds a degree in Computer Science from Thames Valley State and is a member of the American Production and Inventory Control Society.*

Ed Blumstein *is Cullinet's Manager of Financial Applications Software Development and has directed Cullinet's rapid entry into this field. He joined Cullinet in 1981 with experience in database and applications software. Ed holds a B.A. in Economics from Brown University and an M.B.A. in Finance from Boston University.*

Cullinet's Financial and Manufacturing applications, designed in the 80's, are the first applications on the market that feature both vertical and horizontal integration. Vertical integration means the application is built with fourth generation languages fully integrated with a Database Management System including Decision Support Systems and Personal Computers.

Horizontal integration means all applications share a common database thus eliminating the traditional problems of duplicate data, multiple updates, file conversion, etc., associated with older applications. For example, the purchasing and accounts payable system share the same vendor file. One update to the database means that all applications using that data are updated.

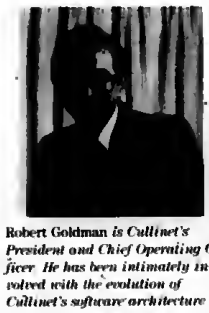
Also, Cullinet's applications are very easy to install and to tailor to the changing requirements of any organization. This is made possible through the use of a powerful fourth generation language. For example, all the on-line transactions of Cullinet applications are written using Cullinet's powerful Application Development System. In addition, information from Cullinet applications can be accessed and analyzed for senior management purposes using Cullinet's touch sensitive TREND-SPOTTER system or Cullinet's Personal Computer software.

The combination of horizontal and vertical integration means for the first time applications are available that meet the requirements of both the data processing and user management.

All successful applications software of the future will be built taking advantage of advanced database technology. Cullinet is the first to have introduced applications using this technology.

What About

Cullinet's Information Syst
Strategies for the 80's and



Robert Goldman *is Cullinet's President and Chief Operating Officer. He has been intimately involved with the evolution of Cullinet's software architecture and the Company's strategic direction for the last 10 years. Bob has consistently contributed to many aspects of Cullinet's success. He holds a Bachelor of Science Degree in Computer Science from Purdue University.*

Frank L. Chisholm *is Executive Vice President of Cullinet and is also responsible for the Company's extensive field operations, including sales and technical support activities. As a key member of Cullinet's management team, Frank has contributed heavily to Cullinet's product development strategy. Frank has been with the Company for over 6 years. He is a graduate of Pierce College with a degree in Computer Science.*

Often, as many as seven or eight major corporations from t
States and around the world visit Cullinet's headquarters i
Westwood, Massachusetts each day. They are coming in in
numbers because they've heard about what Cullinet is doi
information systems technology, and it sounds very excitin
After the meetings, the unanimous view is that what Culli
doing "makes sense" and they are convinced that Cullinet
tion in Information Systems is the route that their respectiv
organizations should be taking. It is, in their opinion, the o
coherent and intelligent approach available. Specifically, t
the full integration of Database, Applications, Decision Su
Systems, Information Database and Personal Computer So
other words, a single source of software as opposed to the
tation which has plagued the computer user in the past.

Often, these visitors return to our headquarters with the I
other senior officers of their organization for an Executive
This Program is presented on a CEO to CEO basis. Senior m
ment is interested to learn that there has been more progre
in the delivery on the promise of computers for top manag
the past year than there has been during the previous twe
The promise of computers for top management is "knowi
they have a problem in time to take corrective action." In
accomplish this, it requires the full integration of Database
tions and Decision Support Systems. When management u
the importance of the integrated software solution, the re
renewed enthusiasm by them for support of the Informati
activities of their companies. They know that their respec
panies must put in place new information systems, fast, in
compete or even survive in the future. That, in the final a
what Cullinet is about, providing a complete and integrate
solution for the 80's and 90's.

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Winter Seminars 1984

continued

CITY & STATE	DATE	DB	FIN	MFG
Hartford, CT	Feb 14	•	•	•
Indianapolis, IN	Feb 21	•	•	•
Indianapolis, IN	Mar 27	•		
Jackson, MS	Mar 15	•		
Joliet, IL	Feb 9	•		
Kansas City, MO	Feb 22	•	•	•
Knoxville, TN	Mar 28	•		
Lansing, MI	Feb 1	•		
Lexington, KY	Mar 30	•		
Little Rock, AK	Mar 13	•		
Los Angeles, CA	Feb 9	•	•	•
Los Angeles, CA	Mar 27	•		
Louisville, KY	Feb 16	•		
Madison, WI	Mar 15	•		
Meadowlands, NJ	Mar 7	•	•	•
Memphis, TN	Feb 23	•		
Merrimack, NH	Mar 29	•		
Miami, FL	Feb 16	•		
Milwaukee, WI	Mar 7	•		
Minneapolis, MN	Mar 28	•	•	•
Moline, IL	Feb 3	•		
Montreal, PQ (French)	Mar 14	•	•	
Montreal, PQ (English)	Mar 21	•	•	•
Nashville, TN	Feb 16	•		
New Orleans, LA	Feb 23	•		
New York, NY	Feb 22	•		
New York, NY	Mar 20	•		
New York, Long Island, NY	Mar 27	•		
New York Rye, NY	Mar 13	•	•	•
Oakland, CA	Mar 13	•		
Oklahoma City, OK	Feb 9	•		
Omaha, NE	Mar 1	•	•	•
Orange County, CA	Mar 6	•		
Orlando, FL	Feb 7	•		
Oshkosh, WI	Feb 28	•		
Ottawa, ON	Feb 1		•	
Ottawa, ON	Feb 21	•		
Philadelphia, PA	Feb 8	•	•	•
Pittsburgh, PA	Feb 29	•	•	•
Portland, ME	Feb 24	•		
Portland, OR	Mar 15	•	•	•
Providence, RI	Mar 22	•		
Quebec City, PQ	Feb 15	•		
Quincy, IL	Feb 20	•		
Raleigh, NC	Mar 20	•	•	•
Richmond, VA	Feb 8	•		
Rochester, NY	Mar 28	•	•	•
Rockford, IL	Feb 14	•		
Sacramento, CA	Feb 21	•		
St. Louis, MO	Feb 8	•	•	•
Salt Lake City, UT	Feb 21	•		
San Antonio, TX	Mar 15	•		
San Diego, CA	Feb 23	•		
San Jose, CA	Feb 14	•	•	•
Savannah, GA	Feb 3	•		
Seattle, WA	Feb 7	•	•	•
Somerset, NJ	Feb 8	•		
South Bend, IN	Feb 7	•		
Springfield, IL	Mar 5	•		
Springfield, MO	Mar 29	•		
Spokane, WA	Mar 28	•		
Syracuse, NY	Feb 14	•		
Tallahassee, FL	Mar 1	•		
Tampa, FL	Feb 8	•	•	•
Toledo, OH	Feb 24	•	•	•
Toronto, ON	Feb 2	•	•	•
Toronto, ON	Mar 20	•	•	•
Tucson, AZ	Mar 20	•		
Vancouver, BC	Mar 14	•	•	•
Washington, DC	Mar 8	•	•	•
Wichita, KS	Mar 8	•		
Wilmington, DE	Mar 27	•		
Winnipeg, MB	Mar 6	•	•	•
Worcester, MA	Feb 16	•		
York, PA	Feb 15	•		

To find out more
Attend a Cullinet Seminar.

Cullinet will conduct seminars on the dates below. Check the listing and sign up for a seminar in your area.

Winter Seminars 1984

CITY & STATE	DATE	DB	FIN	MFG	CITY & STATE	DATE	DB	FIN	MFG
Albany, NY	Mar 13	•			Cincinnati, OH	Feb 7	•	•	•
Allentown, PA	Mar 1	•			Cincinnati, OH	Mar 21	•		
Atlanta, GA	Feb 15	•	•	•	Cleveland, OH	Feb 3	•	•	•
Atlanta, GA	Mar 28	•			Cleveland, OH	Mar 28	•		
Arlington Hts, IL	Feb 23	•	•	•	Columbus, GA	Feb 28	•		
Augusta, GA	Mar 14	•			Columbus, OH	Mar 9	•	•	•
Austin, TX	Feb 14	•			Davenport, IA	Mar 13	•		
Baltimore, MD	Feb 21	•	•	•	Denver, CO	Feb 7	•	•	•
Bloomington, IL	Feb 21	•			Des Moines, IA	Feb 16	•	•	•
Boston, MA	Mar 8	•	•	•	Detroit, MI	Feb 9	•	•	•
Boston Westwood, MA	Feb 23	•			Detroit, MI	Mar 14	•		
					Edmonton, AB	Feb 15	•		
Bowling Green, KY	Feb 1	•			Ft Lauderdale, FL	Mar 22	•		
Bridgeport, New Haven, CT	Mar 6	•			Ft Wayne, IN	Mar 6	•		
					Ft Worth, TX	Mar 15	•		
Burlington, MA	Feb 9	•			Grand Rapids, MI	Mar 27	•		
Charleston, WV	Feb 29	•			Greenville, SC	Mar 6	•		
Charlotte, NC	Feb 23	•	•	•					
Chicago Rosemont, IL	Mar 20	•							

continued

Mail coupon or telephone (617) 329-7700. There is no charge for Cullinet seminars.

Sessions are held concurrently, so it is only possible to attend one seminar per date. Clearly indicate the seminar of your choice.

I plan to attend your seminar in:
( ) IDMS/R ( ) Financial ( ) Manufacturing

City: on Date:

Names and titles:

Organization: Address:

City: State: Zip: Phone:

Computer and operating system:

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Interviews: Vigilante, Casales, Schwartz

AT&T is getting down to new business in 1984. Product introductions are scheduled for the second quarter; several major acquisitions and tie-ups are coming as well as new marketing and service policies.

Lead player in the organization is the new AT&T Technologies Group, which encompasses the old Western Electric organization, Bell Laboratories, AT&T International and AT&T Information Systems. Since Federal Communications Commission restraints oblige the company to keep its manufacturing and marketing activities separate, AT&T Information Systems will serve as the marketing end of the company for all except consumer products. AT&T Information Systems is that part of the company with which most users and competitors will deal directly.

AT&T Information

Continued on ID/3

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Dataproducts computer printers

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AT&T interviews

Continued from 39/1

Systems employs about 100,000 people organized in a central staff and six regions. About 27,000 people will work in sales and marketing and 60,000 will move over from the operating companies to handle service. AT&T Information Systems takes over responsibility for the embedded base currently leased from the operating companies, and from there on in it will be competing with them as well as with the independents for the customer premises equipment market.

Under the current structure, AT&T Information Systems is headed by three coequal presidents, Frank Vigilante (product planning and development), Robert Casales (marketing and sales) and Bruce Schwartz (service). All report to AT&T Information Systems Chairman Charles Marshall. In interviews last month with Brian Jeffery, research director of International Technology Group, they spoke on the market, competition and the plans and prospects of AT&T in the information processing marketplace.

Cover picture: "The Spirit of Service" illustrates the reputation for service AT&T would like to preserve as it enters a new era of business. Angus MacDonald patrolled the New York-to-Boston line during the blizzard of 1888. In June of that year, he posed for the photograph on which the drawing was based.

Frank Vigilante
President, Product Planning and Development
AT&T Information Systems

Nearly every major vendor wants to link up with us. And we will — we want to open our architecture, and we expect that from time to time you'll see announcements with major vendors about linking up with our systems. There's a lot of interest. I won't tell you names, but if you named six of the biggest companies around, probably four or five have called about wanting to link up with us . . . Many of them would like to go into business with us, but that's another story.

You have been quoted as saying that new products planned for 1984 will form part of a "general plan for data." What do you mean?

Well, instead of announcing one or two boxes, we would like to announce a little more in the way of architectural planning for data . . . I think it will be in the second quarter, although it could be later. We intend to relate announcements in several areas, probably local-area networking and some kind of processing, and perhaps some workstations. We would make an interrelated announcement and, of course, relate those products to our current line. Whatever we announce has got to relate to the rest of our product line so our customers know what we're doing.

How are you defining local-area networking?

What it means to me is a specialized network for certain customers. Not everyone needs a local-area network. We already have one in the System 85, and we will [enhance this capability] with other announcements. However, there are some customers who have large numbers of terminals that they want to connect to hosts. It doesn't pay to switch those, to make a lot of connections through a voice/data switch. So if they have hundreds of terminals connecting to hosts, then they should have a separate network to serve those rather than switching them through the System 85.

We can use the System 85 as is for most customer needs for interconnection of terminals and hosts. However, if there is a very large requirement, then we want a local-area network to take care of that.

So you're talking about something that would allow a higher transmission speed?

Yes, but more important is high occupancy . . . It will have packet-switching.

What do you regard as the main requirements for workstations?

One of them is that the stations that we put on work with some synergy with our switches so that we can use our own applications processors to work with them. We believe, like everyone, that we're evolving toward a point where a single station

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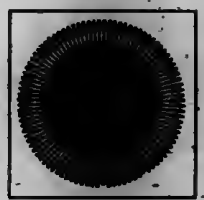

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or maybe two will perform most of the functions required.

So you'll get something that performs like a personal computer but at the same time works with at least mini-level hosts. I'm not talking about big mainframes; I'm talking about minis and superminis — our workstations will work directly with those. Probably, we would also provide some kind of compatibility with [Microsoft, Inc.'s] MS-DOS because that seems to be sweeping the field. [We want] to get as many capabilities in a couple of stations as we can.

You mentioned an announcement related to "some kind of processing." What will that involve?

We already have an application processor attached to the System 85. What we will be doing later is probably adding more power — we'll add an application processor that has more power than the current one, the AP 16. We'll add a bigger, more capable machine to that product line. The thing is that you have to handle large buildings. Some of the System 85s [with the larger processor] that we'll be putting in next year are for very large customers. And so they need a larger application processor than we currently have.

Do you see yourselves moving into the territory of the DP vendors with this?

Well, somewhat. We're talking about only a certain part of the range here. We'll have presence at the lower end and in the middle. We have no plans for anything more than that . . . The big mainframe business is not in our plans at this time.

So what you're talking about offering here is a communications architecture. Is that a reasonable description?

Yes.

Is this going to be comparable to, say, the IBM architecture?

Well, I suppose, broadly speaking, it will be, but SNA is primarily a linkage of computers, [particularly] the large systems that IBM offers. Our architecture is a linkage of, for example, a System 85 or a Dimension with our applications processors and with terminals. So broadly speaking, yes, we have an information systems architecture that we're evolving, but it's for different kinds of equipment than the SNA systems that IBM works with. Now at some point we need to link to SNA, and we will do that if we possibly can.

So you see yourselves coexisting with the IBM world?

No question about it, yes.

What kind of response have you been getting to the Unix operating system?

Unix is getting very popular, in many ways exceeding our expectations. There's plenty of evidence that Unix is becoming a very popular and broadly used operating system. Now I'm not saying it's going to supplant all the other operating systems, but it's going to take its place alongside all the others and be one of the more popular systems. I believe Unix has caught on. It was given to the colleges for a long time, and a lot of the students coming out want to work on Unix because they learned it in college. They bring it to the work place, and it seems to have caught on very well.

Have you found much acceptance of Unix from corporate DP departments?

I don't know the answer to that question. I think it's just beginning. It certainly hasn't had any penetration in the large mainframe operating systems area, no. But I believe it will.

What will be the relationship between the kind of solutions you've been describing and the broader services offered by AT&T Information Systems?

They're linked together. If there's an electronic mail system on a System 85 or on a related local-area network, we want to link it with a system like Net/1000, and we'll be able to move messages from our local system through . . . Net/1000 and on into either a terminal on a customer's premises that might be [linked to] one of our processors or somebody else's, or to another System 85. If you have a compatibility across the whole range of systems, you can move information from local to network and back down to local again as required.

So you're talking about a global architecture here?

Yes, we are. That's the kind of thing we've always done — we have networks across this country right now. Nobody else is anywhere near us on that, and we want to keep capitalizing on it. Our System 85 can be set up nationwide, System 85s that are linked together. It looks like one system. Nobody else can do that.

Do you find that your customers are looking for that type of solution?

Definitely. Our large customers — I could name you half a dozen, but I'm not going to — expect technological excellence from us, and they believe in the tradition of Bell Labs and Western Electric. And they also expect us to be excellent in networking. They know what we've always done — put together the world's largest

networks — and they want us to help them plan their networks. We're doing that.

So you are assisting companies in setting up their own networks?

If that's what they want to do. [Or] they can buy it from us and have us run it, or they can lease it from us. We've gotten very flexible. This is a big improvement as we're getting away from regulation. We've become very flexible in service arrangements and in pricing arrangements with customers, and we'll do whatever they want. We couldn't do that in the past.

With large customers, do you find you're dealing with a single set of decision makers or still with different departments such as DP, telecommunications and the like?

There's both, no question about it. The large customers in particular have several departments that get involved. Many customers are also trying to get some corporate control over expenditures, which is leading them to want to centralize more. What they try to do is make deals on a corporate level and then try to get some control over what's going on in the branches and remote locations. I think they're having some success.

When they do that, they want to deal with a large, dependable vendor, and we find them very much coming to us for that kind of operation. They can't afford to risk it with a fly-by-night who might be out of business in another year. There are a lot of people in this business now that aren't going to be in it in a few years. It's overcrowded right now, and a number of our competitors will be off doing something else in a few years.

Whether some of the computer companies will end up being in our business and we in theirs to a significant extent, I don't know. Everyone seems to think so. There's endless talk about our competing with IBM, DEC and the others, but that talk has been going on for a long time, and there really is not yet significant competition between us. Maybe there will be, but I think our main competitors will continue communications-based companies.

What competitors are you thinking about here?

I'll leave that to your imagination.

How do you see your relationship evolving with the Bell operating companies?

In the near term, we are largely going to be competitors of them. They are willing and able to sell customer premises equipment in their territories, and we'll be in competition with them in a number of cases. They will offer Centrex, and we will, of course, be competing against Centrex. In some cases, they will be offering products from other vendors, and we will be competing against those.

On the other hand, they'll be customers of ours for certain things, and so you'll get the kind of mixed relationship that is very common these days. Companies can be customers of each other and competitors with each other, and that's what's going to happen here.

But do you see the Bell operating companies emerging as fairly significant players in the marketplace?

I think they would like to be. It remains to be seen whether that will really happen.

A number of agreements have been announced relating to interfaces with AT&T equipment, notably Wang Laboratories, Inc., Hewlett-Packard Co. and Bailey Controls. Are we going to be seeing more of these?

Yes, there will definitely be more like that. Nearly every major vendor wants to link up with us. And we will — we want to open our architecture, and we expect that from time to time you'll see announcements with major vendors about linking up with our systems. There's a lot of interest. I won't tell you names, [but] if you named six of the biggest companies around, probably four or five of them have called me about wanting to link up with us.

How do you mean "link up"?

Just about anything, but the major thing would be general-purpose interfaces, high-speed data communications, document transfer, that kind of thing. Many of them would like to go into business with us, but that's another story.

Do you see AT&T making more substantial tie-ups with other companies, say by acquisition or joint venture?

Well, we're looking at a number of these. How many of them are sure, I don't know, but there's an interest. Just what we'll do [is] very sensitive information. But we certainly have an open interest, and my guess is

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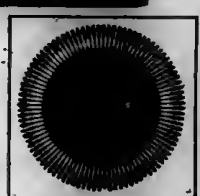

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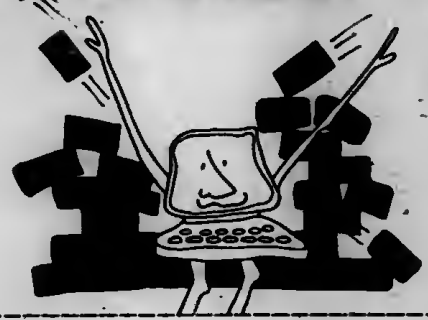

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How is your relationship with Digital Equipment Corp.?

We have a long-standing relationship with DEC — we're very good customers of each other and have been for years. And I would say our relationship is still good. That's all I want to say.

We haven't seen any major endorsements from DEC on the Unix operating system.

I don't want to comment on that.

Where do you see AT&T Information Systems in five to 10 years?

The first thing I will tell you is that we will still be in business, and I expect we'll be prospering. We believe that working in an unregulated environment that is growing more unregulated with time, we can begin to improve our market share in all areas of voice communications and voice/data communications. And I expect that five years from now our market share in those areas will be considerably higher than it is now.

Whom do you see as your main competitors in that time frame?

One of them will probably be Northern Telecom. They're a reasonably broad-based company and I believe they'll continue to do well. Another that will hang in there is some collection of the Japanese companies. Nippon Electric seems determined to stay in this business, and obviously they have the resources to be successful, so I would expect Nippon Electric to be a significant competitor of ours indefinitely.

Whether some of the computer companies will end up being in our business and we in theirs to a significant extent, I don't know. Everyone seems to think so. There's endless talk about our competing with IBM, DEC and the others, but that talk has been going on for a long time, and there really is not yet significant competition between us. Maybe there will be, but I think our main competitors will continue to be some of the communications-based companies. Some of the others I believe will be gone by that time.

Some of the small PBX vendors have found a niche here and there, [but] I have serious doubts that they'll be able to survive standing on their own. They may get absorbed by others and in that way survive, but otherwise I don't see how they're going to make it in this business with the current competitive levels. But I could be wrong. The business could expand a lot more and make allowance for everyone.

What about competitors in the computer services business?

Well, we have some competition with them through our Net/1000 offering; there'll always be some competition there. We have competition

We can assist customers in setting up their own network, if that's what they want to do. Or they can buy it from us and have us run it, or they can lease it from us. This is a big improvement as we're getting away from regulation. We've become very flexible, and we'll do whatever they want.

there now with IBM, but it's not a big volume of business. That tends, in any case, to be an offering that we like to make together with our other products, and I don't see it dominating our business.

How do you see the long-term changes in AT&T Information Systems?

Well, I guess the major change has been a lot of communications processing being added to our products. I don't want to call it data processing — that's not what it is. It is processing for communications, processing for networking, allowing people to communicate more easily. That's the area that I believe we will grow and prosper in because that's been our tradition, supported by very strong technology based on our Bell Labs roots.

Presumably you'll be more competitive?

There's no question about it. We have a strong thrust now, and I believe we'll continue to hone down the organization and sharpen our own competitive skills. Some of our obligations from the past give us a little more expense in some areas than we would like, but we're taking care of those things. We're very confident of success. I think when we get past all the regulatory hurdles — and we're almost there now — when we can spend our full energy on the business, we'll do very well.

Do you think that will be reflected in the public perception?

I already see a lot of perceptions turning around. When I see all the negative publicity we got a year ago, and I compare that to now, I think it's a lot better. There's still some negative stuff out there, but I see a lot of good things, too. It is turning around, and I believe there'll be a preponderance of good information about us in the press as time goes on, although there will always be people that find some fault with big organizations and want to kick us around a little bit. That's their prerogative.

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Robert Casales
President, Marketing and Sales
AT&T Information Systems

With the divestiture final, what are your priorities for AT&T Information Systems?

First of all, AT&T leads in and is committed to a major posture in the world of information movement and management. There is a great opportunity for our business in that environment. There is, we believe, a great need in the marketplace for the capabilities that we have as a corporation. AT&T Information Systems, then, is the deregulated entity with the mission to bring that technology and those products and services to the opportunities in the marketplace.

Now, we've looked at that marketplace in a very broad way, and we've cut it in ways that would segment functions, in ways that would segment customers, industries and so on. So when we talk about a direction for the corporation, we're talking about it in the context of a "polar direction."

In that context, we think about doing business in those arenas that you might want to segment along the lines of data and voice. For voice, [in terms of AT&T Information Systems], I mean the premises equipment and networks associated with voice; we look at enhancing services with computer-based applications in transfer, storage, retrieval, editing and so on.

[On the data side], we look at the office environment, what has been an office equipment environment but is really evolving to what we think of as an office automation environment. We perceive our potential to cut across all those segments.

Looking at the office automation environment, AT&T has traditionally been selling PBXs to telecommunications departments. How are you changing that emphasis now?

Well, we're finding that it is shifting in the marketplace itself. As the Fortune 500 companies begin to link their business strategies with their computer and communications strategies, the decisions that they make cut across all those areas. So when you market, you have to market to all of those areas — we market to the telecommunications manager, we market to the DP managers and we market to the decision-influencers.

The tendency is to characterize a solution as being offered by a company in a specific business. What we're talking about is solutions that cut across these definitions. It isn't that someone offers a computer solution and someone a communications solution. They both offer a solution that embodies the technologies of both computing and communications. We do not want our customers to think of decisions associated simply with hardware; we want them to think in terms of a much broader business context.

So you will, in fact, be offering solutions that have previously been offered largely by computer vendors?

I think that's correct. I think it's important to recognize that often the tendency is to try and characterize a solution as being offered by a company that has been in a specific form of business. What we're really talking about here is solutions that cut across these definitions. It isn't that someone offers a computer solution and someone a communications solution.

They both offer a solution that embodies a lot of the technologies of both computing and communications. We do not want our customers to think of decisions associated simply with hardware; we want them to think in terms of a much broader business context.

Do you see any shift in the market towards more centralized decision making in, say, office automation?

What we see in the marketplace is an enormous proliferation of divergent technologies — personal computing is an example. These divergent technologies create considerable pressures for managers — they have to ensure that the technologies now being utilized permit them to bridge from where they've been to where they believe they want to go. They have to be able to protect their investments in, for example, their word processing systems or their applications portfolio. So they need to know that new technologies permit them to utilize those applications and permit access to those applications to be expanded within their user groups. I think they are trying to manage both the centralization

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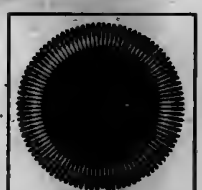

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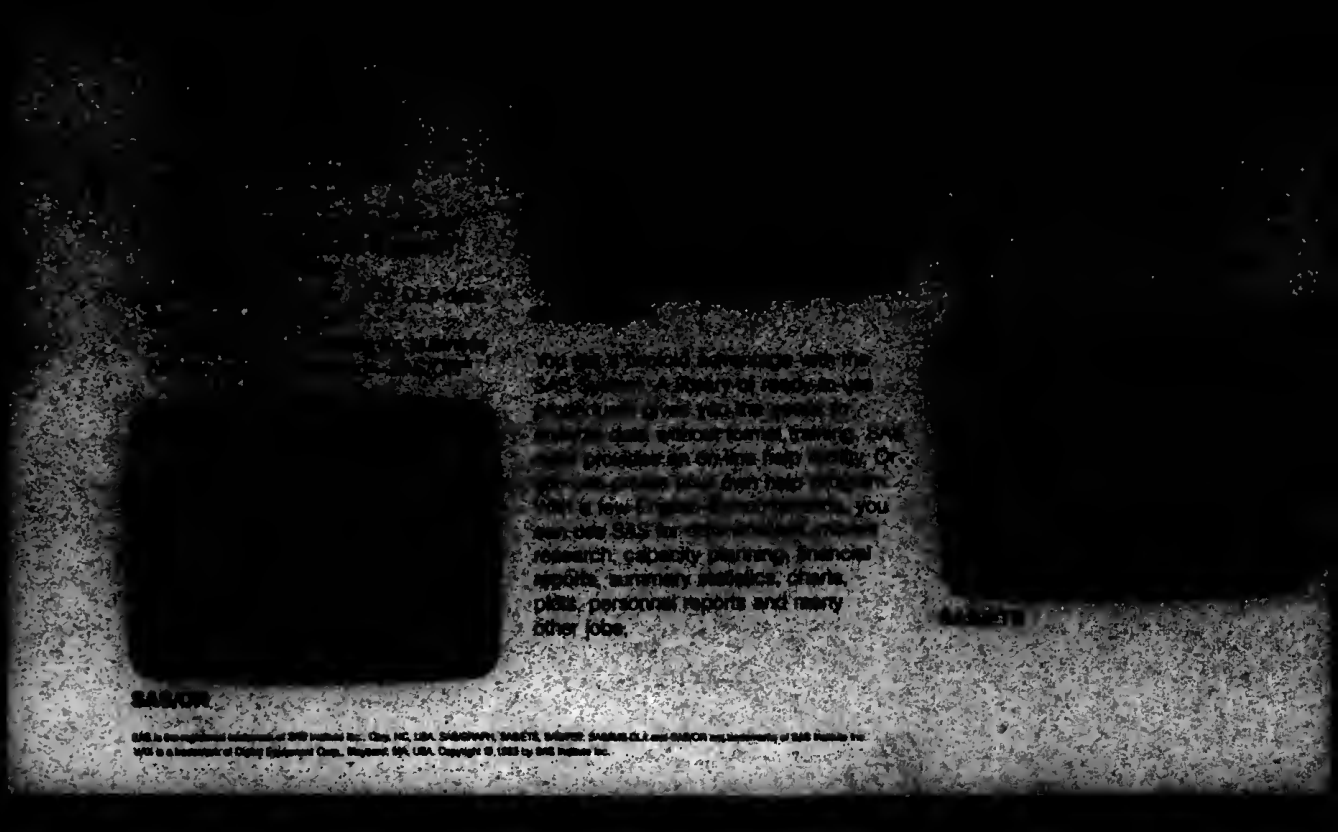

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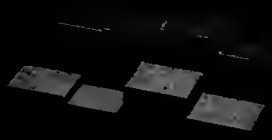
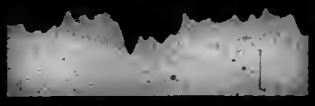
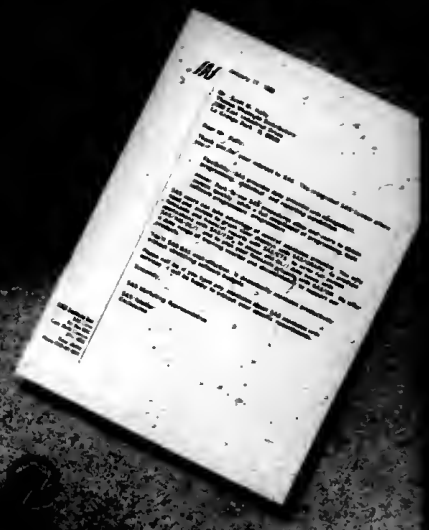






and the distribution of technology, and it's not an easy task.

You're talking about the integration of a number of different technologies here. How does local-area networking fit into the picture?

We see local-area networks as being really the highway that permits our customers to move information in different media — voice, data, video, graphics and so on. It's the highway for the various professionals and departments within the company that permits the integration of that information and its transfer to users in various forms. [It may be] high speed or the lower band speeds, but all of it will be managed on the network. It's an open approach. We think that's terribly important to productivity. Our customers can begin to manage the distribution of information to those in their business who need to have it.

So you would see these needs as something that could not be handled by existing PBX technology?

You have various transmission media — twisted pair, for example, which works very well in the context of a PBX, is a major component of the local-area network. You might have other requirements in terms of very high-speed data that might be outside the realm of the PBX, but that doesn't mean that you take it outside the local-area network. Our plan is to have a local-area network that is integrated with a PBX.

How do you see the future of the Centrex system?

I think Centrex has been a good service. The issue there really rests in how responsive it can be to the user, and I think the marketplace is looking for greater access, greater flexibility, greater control of the technology by the customer. I think that is more difficult to do with a service like Centrex.

Will we see more links between AT&T and other vendors, similar to the HP and Wang announcements recently?

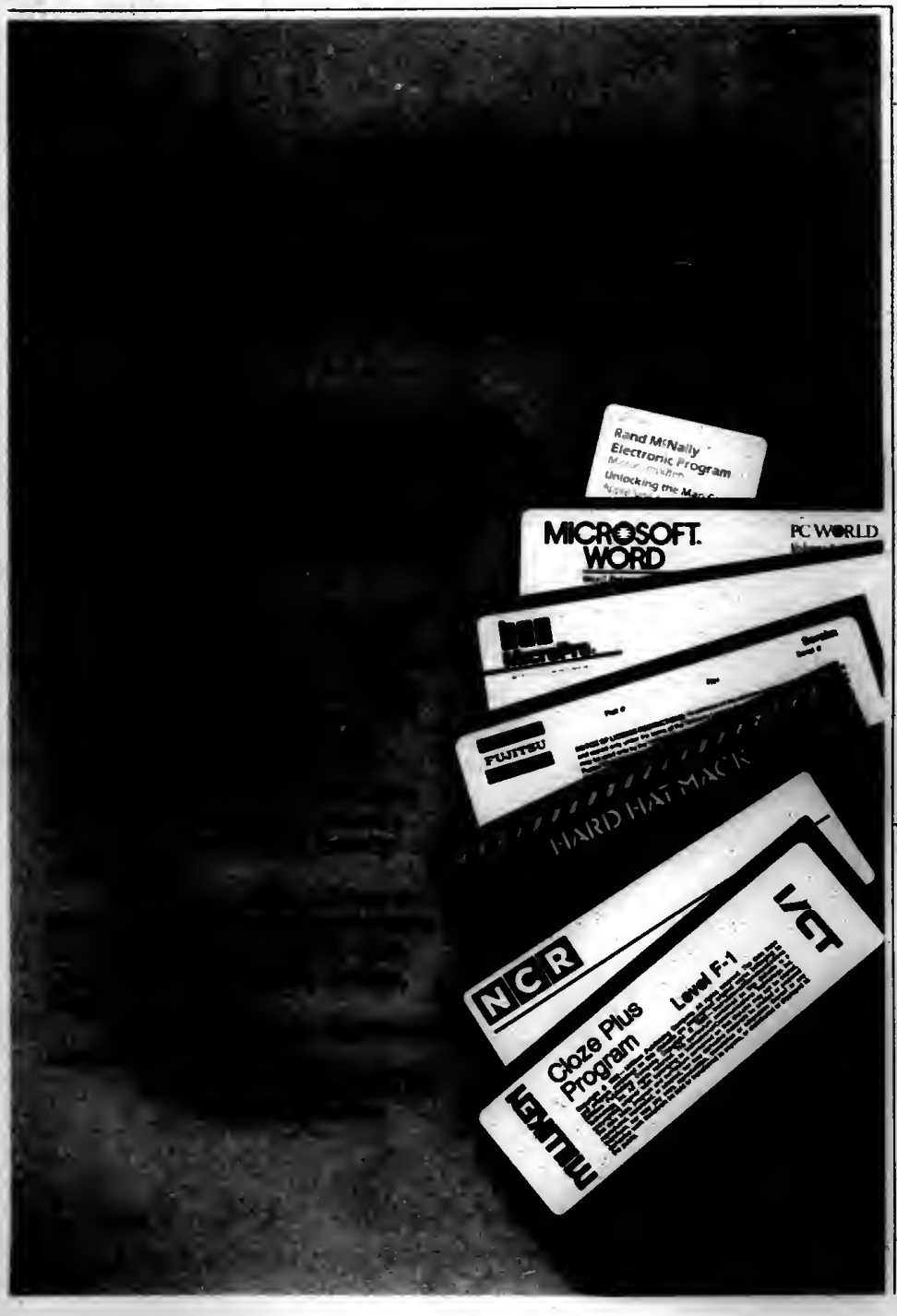
Yes, clearly, with vendors that have a vested interest in the marketplace we're talking about. Those who have a customer base that they want to protect, who want to ensure that their systems interact with ours so that the opportunities for utilization of their systems by their customers are maximized . . . This isn't the kind of game where any one company can be all things to all people.

One of the things we've been seeing in the marketplace is the emergence of IBM as a de facto standard. What is AT&T's position on standards matters?

If you mean in terms of, say, an IBM architecture that we would have to be compatible with in order to be successful, we clearly will be compatible. Do we need to be compatible with SNA [Systems Network Architecture] and SDLC [Synchronous Data Link Control]? Yes, we intend to and we will do that.

We have seen a number of statements from AT&T Information Systems that indicate you will be offering a distinct communications architecture next year. Is that correct?

Yes, you will see a communications architecture. That is part of our philoso-



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phy in terms of our business and in achieving what we expect to achieve in the marketplace, that that architecture will be open.

What about the low end of the PBX market, say the small business market? What penetration are you seeing there?

People want the capability for voice and data in communications in a way that doesn't require expensive capital outlays. They evaluate it with considerable price sensitivity, they want the function level that's appropriate to the needs of their business. I think they want access to those networking capabilities that permit them to grow their business and interact in various ways with other businesses.

So you are thinking in terms of providing the small businessman access to the outside world through data as well as voice, presumably through Net/1000?

That's correct. It's why the concept of our systems and network services being shared as well as dedicated is very important, because in sharing them, you then have a very low threshold of entry per user. You might use an example where a small business wants to use a service like Net/1000 for interactions and purchase orders — with us, or with one of their customers or suppliers. They would have a capacity in the network to do that and to utilize the technology and intelligence in the network to do that. [It] offers them considerable efficiencies and the potential for economies over other methods.

The issue of data base management is terribly important. What is, perhaps, paramount is the operating system software that supports those data bases and lets you begin that accessibility to a wide range of users . . . We see a tremendous amount of activity in the area of data base management and a tremendous opportunity for access to data base services. Data has to be packaged and then distributed to customers, and that distribution technology has to have access to a central data base and has to accommodate all the users on the other end.

What kind of market interest are you finding in data base services?

I think the issue of data base management is terribly important. What is, perhaps, paramount is the operating system software that supports those data bases and lets you begin that accessibility to a wide range of users. If you look at a service like videotex, critical there is the cost of the technology and the access that

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you can offer for it. We see a tremendous amount of activity in the area of data base management, and I think a tremendous opportunity for access to data base services. If you look at the financial services industry, for example, you see more and more use of on-line data bases. Data has to be packaged and then distributed to customers, and that distribution technology has to have access to a central data base and has to accommodate all the users on the other end.

How do you see videotex evolving?

There's a lot of review of that question today, and, in fact, we've had discussions with some of our large customers. I think that [companies in] the marketplace are working to ascertain how that technology and service can be utilized in their business, especially that have broad-based consumer business. I think this is going to evolve in the course of the next few years, but I think it's kind of being shaped at this point.

We're finding that it is shifting in the marketplace itself. As the Fortune 500 companies begin to link their business strategies with their computer and communications strategies, the decisions that they make cut across all those areas. So when you market, you have to market to all of those areas — to the telecommunications manager, to the DP manager and to the decision-influencers.

AT&T Information Systems is obviously going to be presenting some new capabilities here. But then, so are a lot of your competitors. How is AT&T-IS different?

Well, I think that if you look at the world or the marketplace the way we have looked at it, and the way you and I have discussed it, AT&T-IS comes from a very strong base in terms of communications. I think the marketplace recognizes, as we recognize, that's what is really going to be at the hub of the integration that we talked about.

I really think that we are better positioned than any of our competition, and we have a very real distinction from our competitors in terms of our history and our knowledge, resources and service. That's really captured in our antecedents in Bell Labs, in Western Electric and in our long history of service to the marketplace. I don't think there are many competitors today that enjoy equal stature in terms of capabilities.

Who would you say does enjoy equal stature?

Well, if you were to say who enjoys the complement of R&D and service in the same way, I think IBM very much enjoys that reputation.

You've talked in terms of knowledge, resources and service here. You haven't talked about being innovative — AT&T has not recently had the reputation as an innovative company.

It's pretty tough when you have been primarily a regulated company to enjoy an innovative reputation. I think we have enjoyed a reputation of being innovative in our basic research and in some of our technologies. For example, cellular radio is an important technology and really we were ready to bring it to the marketplace about 10 years ago. The course of regulation has taken that much time. You can't enjoy an innovative reputation when you have to deal with the rigors of the regulatory process to bring technologies to the marketplace.

You have a liberal arts background.

I do — my college major was English. My background professionally is in marketing.

Has your original liberal arts background been an asset?

Very much so. What I think is of great benefit in a liberal arts background is the capacity to develop a capability in thinking, being able to understand issues and being able to translate thinking from the strategic to a tactical perspective. Being able to recognize that if you are in the business of dealing with the marketplace and with customers, much of your strategy must be driven from your capacity to think as an organization.

I think it's fundamental — if you think about all of the dynamism taking place in the market, you need the ability to understand and to respond quickly and to use different marketing techniques, to use a multitude of distribution channels, owned and nonowned, to be able to manage and stay ahead. Much of that, I think, resides with those companies that have the ability in their executive environment to understand and to have confidence in their thinking, confidence in their ability to take risks, confidence in the sense of perhaps not being afraid to make mistakes. And I think the better able a corporation is to think [in this way], the greater the success it will enjoy.

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MOTOROLA INC.
Information Systems Group

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Bruce Schwartz
President, Service
AT&T Information Systems

What is the AT&T Information Systems service organization going to look like in 1984?

It will consist of roughly 60,000 people. That is made up of about 30,000 systems technicians and 12,000 people in our business service centers. We have various groups of engineers, and the balance would be management and support personnel. In prior days, we had 22 operating companies, each with a service division, so we had 22 separate service organizations, so to speak. We've been molding that into a national service division headed up by six regions rather than 22 operating companies. So we have a substantially slimmed-down management staff as a result. And then sub-organizations to the regions — we had roughly 350 district level operations divided among the 22 operating companies. We've since reduced that to about 100 such district organizations.

What difference is the average customer going to see?

Let me talk about a couple of things in that area. Since we're nationally organized now, we have established a high-level maintenance surveillance operation — we call it National Customer Service — in Denver. From that location, we remotely monitor the higher end of our PBX switches on a constant surveillance basis. That's new, plus it's more efficient.

In addition, we've established some technical support centers in clusters on a national basis, and we've centered there some high-level expertise in voice, data and software. We call them Voitek, Datek and Softek — not very inventive, but they're pretty effective. The purpose is to give field personnel a close-by location where they can call for troubles that they're not able to fix right away. We've also established in each of the regions a high-tech laboratory. There we have models of each of our major products, so if we get into a difficult situation, we're able to simulate the trouble there with experts and talk the on-site technician through to a problem resolution.

Probably the thing the customers have noticed most is our new mode. We've been moving into this all through 1983 — it's not a "stroke of lightning" kind of thing. In the past, we had repair centers located in each of the Bell operating companies — thousands of them. People who had trouble would call into this repair center, and then the people there would assign the trouble reports to systems technicians on a random basis. So one customer might see four or five different technicans in any given period.

We've been putting in place for the last 12 to 14 months [a system where] we assign customers on a permanent basis to a particular technician who is dedicated to that account. The smaller customers may have one technician who has four or five customers on a permanent basis. That way we're able to zero in on our customers . . . Under the plan or reorganization, the overriding rule has been that people follow their work. So in a high percentage of cases, easily 90%, the technician who has been maintaining a customer's switch before divestiture will be maintaining it in the future. A lot of customers won't be seeing a change in personnel. But we'll have more of an entrepreneurial approach to service and maintenance.

Will we be seeing any major changes in service policies?

Yes, in fact there'll be several. As the rules go from regulated to unregulated, of course there's a lot of opportunity for change. We'll give to the customer more options on service arrangements. The customer may want maintenance eight to five, Monday through Friday — we'll have an

Let me say some of the things that haven't changed: dedication to service, a commitment to service that just transcends everything we do. I have an old picture in my office . . . of a lineman trudging through the night in the snow with a coiled wire over his arm, looking for a break in the line. That always kind of captures what you call the spirit of service. Maybe it's all corny, I don't know, but it's a deep heritage.

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This approach makes even more sense when you consider that any given terminal is only on-line about 20% of the day. It's a more efficient use of computer resources, more economical, and altogether easier to implement than any other option in front of you.

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MOTOROLA INC.

We've been putting in place for the last 12 to 14 months [a system where] we assign customers on a permanent basis to a particular technician who is dedicated to that account. The smaller customers may have one technician who has four or five customers on a permanent basis. Under the plan of reorganization, the overriding rule has been that people follow their work.

arrangement for that. Other customers may want 24 hours, seven days a week, and we'll have an agreement in that. Others will want more — they may want someone to help design or plan their entire system. We'll have an arrangement for that.

You'll be offering more in the way of support for system design, configurations, that kind of thing?

Yes. We have in our group a tremendous network engineering capability — very good at network design, very good at network maintenance and very good at network monitoring. So we can monitor the performance of customer networks, recommend changes and more effective rearrangements. We know the communications business.

How will the kind of service you will be offering differ from that of your competitors?

I think it's substantially better. We're everywhere. We have a ubiquitous force, and they're highly trained. For example, we've trained a number of technicians this year in software . . . We've trained about 300 so far through this new software training. We review Unix, we review about four computer languages and do some basic programming. I've got to tell you, they're just like kids at a candy store. Those that have gone out to customers afterward are just eager to get in and [talk] with customers about how our applications processors interface with other applications. So we're going to continue that training as we need it.

We have a nationwide remote maintenance testing system that's already deployed. And we have a nationwide spare parts inventory. We're really equipped. We're in all the major locations, where we have trained people. And we have an excellent reputation with our customers. We're not complacent about it; we're out to make it even better than it is. That is our major objective, to increase dramatically the level of customer satisfaction with our service.

How do you propose to do that?

In a number of ways. First and foremost is the process I described earlier where we have assigned a technician to accounts. We call it our customer service management system. It's the technician's account, and he or she becomes more deeply involved with it in performance. The technician knows how the system operates, how the customer wants it to operate.

Yes, but how do you judge performance?

Several ways, the most important of which is the customer satisfaction testing process we have where we constantly test customer satisfaction with the various aspects of our service. From

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IN DEPTH/AT&T's Schwartz

the start, we [cover] the salesman, the billing procedure, the order process — whether it's on time, whether people are courteous. It's a system we've had in operation for a couple of years now, so we know its statistical soundness. We do a lot of factual testing on how many customer complaints there are, how long it took us to process those complaints, how long it took to repair.

How important is the service function to selling AT&T Information Systems?

I've talked to a lot of customers lately about this and in a nutshell, as you add features and functions to your communications system, as your communications system becomes your information system, it becomes the way that you run your business. It's not just something you use to communicate on an intercom with your associates, or to get a call from outside — it is the way that you manage your business. Therefore, what becomes paramount above things like price, perhaps an extra whistle or gong [is] reliability. Reliability is very high on the list. Customers are absolutely aware of that.

Are you going to be making any major changes in pricing?

No, I wouldn't say "major." We'll provide more options to customers, and they'll be priced competitively. But I wouldn't say they'll be major changes.

AT&T Information Systems has concluded a number of agreements with companies like Wang and Hewlett-Packard for implementing interfaces. What is your position on systems attached to AT&T equipment in that way?

We're in the service business. We have a huge embedded base now, but it's not 100% Western Electric. We maintain equipment that is not Western Electric now, and I wouldn't see any reason to change that policy.

So you might be extending maintenance coverage to some of these other systems?

We'll have various maintenance agreements available for customers, and if they're part of a major AT&T Information Systems system, it may be part of the service.

How are your relations with the other divisions of AT&T Information Systems?

I think the Service Division is part of the team. We have a team approach, with the people with development, Bob Casales and his people with marketing/sales, our people with installation/maintenance . . . Everyone understands that while each is important, by itself it can't do much. If you had the best design group in the world, for example, and if you couldn't sell it, you really haven't accomplished much. Vice versa, if you have the best salesmen in the world and don't have a well-designed product, you're not going to be very successful.

You have been with the Bell system now for more than 30 years, starting as a lineman. How have you seen it change over that period?

I don't think I've seen any cataclysmic changes over that period. I've seen us move in the last year — AT&T Information Systems has put about 35 new products in our product line. Technology is moving at a much faster clip than it was 10 years ago. Let me say some of the things that haven't changed: dedication to service, a commitment to service that just transcends everything we do. So that's not changed. I have an old picture in my office of Angus MacDonald — perhaps you've seen it. It's a pretty famous picture, at least in the Bell system, of a lineman trudging through the night in the snow with a coiled wire over his arm, looking for a break in the line. That always kind of captures what you call the spirit of service. Maybe it's all corny, I don't know, but it's a deep heritage.

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SYSTEMS & PERIPHERALS

TI to offer 32-bit CPU
First to use MIT's Nubus

By Patricia Keefe
CW Staff

AUSTIN, Texas — Texas Instruments, Inc. has introduced the Nu Machine, said to be the first commercial system to implement the 32-bit technology developed at MIT. TI now owns the rights to that technology, which it calls Nubus.

TI's first 32-bit processor, the Nu Machine is a high-performance system based on the 37.5M byte/sec Nubus, making the system particularly well-suited for applications requiring multiple or special-purpose processors, such as very large-scale integrated circuit design, printed-circuit board design, simulation and advanced software development, according to the vendor.

The system is expected to attract the interest of sophisticated end users, system integrators and OEMs in the scientific and engineering marketplace.

The Nu Machine is currently supplied with a Motorola, Inc. 10 MHz, 68010-based processor with a 4K-byte, 45-nsec cache memory and a memory management system implemented in hardware. Also included is a Unix-based operating system, high-resolution graphics display, mass-storage peripherals and an Intel Corp. Multibus subsystem.

TI's system reportedly supports 32-bit data transfer and addressing and can support future 32-bit microprocessors. The processor-independent Nubus also allows systems to be designed using other standard microprocessor families or special-purpose instruction sets.

The 800- by 1,024-pixel, 16-in., 60Hz, noninterlaced black-and-white display and bit-mapped graphics controller produce graphics and multifont text. Two

TI's Nu Machine

Winchester disk storage systems are available: a 474M-byte Winchester disk with 30-msec access time and an 84M-byte disk with 20-msec access time. For disk backup, ¼-in. streaming and ¼-in. cartridge units are available, the vendor said.

Also included are a high-bandwidth translator, said to provide an interface between the Nubus and Multibus systems, and a windowing system that provides capabilities for multiple virtual terminals on the Nu Machine's high-resolution display. Programming languages currently available include Fortran and C.

The basic Nu Machine is a small office model configured with a 68010 CPU, a 512K-byte memory, an 84M-byte disk, a ¼-in. cartridge tape, display, keyboard and mouse.

It is end-user priced at $53,450, the vendor said.

TI, P.O. Box 402430, Dallas, Texas 75240.

Oldies still goodies, but change to come

HARD TALK

TOM HENKEL

Computerworld, as do similar publications, talks endlessly about new products, new technologies and industry firsts. The fact is, most DP executives are in charge of what could best be described as ancient hardware — technology that is pushing 20 years old.

While there are outlandish stories about U.S. government agencies still using tube-based processors and dinosaurs like the Philco 2000, classics like IBM's 360 and 370 lines still make up about 10% of the domestic IBM installed base, according to the market research firm, International Data Corp. (IDC). Furthermore, IDC reports that there are still almost 600,000 traditional minicomputers currently in use — the kind most industry watchers wrote off two years ago. IDC predicts that it will take at least until 1985 for the 32-bit architecture made popular by the superminicomputer to become the dominant architecture among computer users.

So if your idea of a step-up in technology is a 370/158, you're not alone. There appears to be a big difference between the technologies that are ballyhooed on the business side of the computer industry and those that are actually used in the trenches — the DP shop.

But just because there is little hope your company will suddenly decide to embrace the latest in computer technology, explore gallium arsenide circuits or install optical disks does not mean you

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Unidot 32-bit systems debut
Based on Unix version

GOLDEN, Colo. — Unidot Systems, Inc. has announced two multiuser, 32-bit systems utilizing the University of California at Berkeley version of Unix.

Cerebra I is said to offer performance similar to Digital Equipment Corp.'s VAX-11/750 system, and the Cerebra II is said to be roughly equivalent to a DEC VAX-11/780 processor.

According to the company, the Unix-based systems will be useful in universities, government agencies and commercial organizations using eight to 32 workstations. Officials say that the systems' floating-point processor will be useful for computer-intensive applications.

The Cerebra systems are based on the National Semiconductor Corp. NS16032 32-bit microprocessor and reportedly feature virtual memory using software utilities distributed by the university.

Unidot's Cerebra

The systems use the Intel Corp. Multibus, an IEEE 796 bus, to offer options for peripheral configuration, the vendor said.

They are said to feature 8K bytes of cache memory with a memory-cycle time of 45nsec.

The Cerebra I has 2M bytes of main memory, 84M bytes of high-performance disk storage, a 16-line intelligent serial controller and either cartridge tape or floppy disk backup, a Unidot spokesman said.

The Cerebra II is said to include a second CPU with cache memory, eight additional serial lines and an additional 1M byte of memory.

The units are reportedly packaged in office-style pedestals with locks designed to prevent tampering of cables, boards or consoles.

Cerebra is the first system to be marketed by Unidot, which has operated primarily as a consulting firm for several years, the spokesman said.

The systems are scheduled for delivery in April, according to Unidot.

Prices start at $36,895 for the Cerebra I and $46,000 for the Cerebra II, the vendor said.

Unidot Systems, 908 Park Point Drive, Golden, Colo. 80401.

CAM/CAE stories needed for report

There's an automation revolution happening on the factory floor, and computerized manufacturing systems are leading the charge. *Computerworld*'s March Special Report will take an in-depth look at computerized manufacturing systems and how they are altering production, planning, operations and the relationship between DP departments and factory automation people.

The report will focus on computer-aided manufacturing and engineering, material requirements planning, robotics, inventory and shop floor control. More importantly, it will look at the impact of these technologies on traditional manufacturing operations.

Contributions are welcome in one of two forms: a tutorial covering a trend or an application story describing a case study of a particular user and product. Manuscripts should be three to six double-spaced typewritten pages in length. The deadline for all submissions is Feb. 10. Charts, photographs or other graphics are encouraged.

Authors should include with all submissions a very brief biography and a telephone number at which they can be reached. Articles should be sent to Bill Laberis or Pete Bartolik, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

SYSTEMS & PERIPHERALS

TURNKEY SYSTEMS

ULTIMACC BUSINESS SYSTEMS GROUP
Champ

The Ultimacc Business Systems Group, a subsidiary of Storage Technology Corp., has announced the Champ, a 16-bit multiuser turnkey business system based on the Fairchild Camera and Instrument Corp. 9445 microprocessor.

Aimed at businesses with annual sales of $1 million, the Champ consists of a central processing unit with 128K bytes of random-access memory, one 50M-byte hard disk drive, a 64 line/min bi-directional printer and two STC Model 4200 terminals, the vendor said.

The basic Champ system can accommodate up to six terminals. A 256K-byte memory upgrade allows users to add up to 15 terminals. A 30 line/min band printer and cash drawer module are also available, according to a spokesman for the vendor.

Designed to be used by operators without previous data processing experience, the system includes its own operating system, called the micro-Champ, peripherals, software documentation, training, telephone support, maintenance and financing, the vendor said.

The Champ system costs $36,000 and was designed for turnkey users in the wholesale/distribution industry. Additional terminals cost $1,950 each, the vendor said.

Ultimacc Business Systems, 4 North St., Waldwick, N.J. 07463

UNITRONIX CORP.
System 4000

Unitronix Corp. has announced its System 4000 with fixed Winchester disk drives of up to 300M bytes and an 80M-byte magnetic tape drive backup.

The System 4000 reportedly offers emulation of Digital Equipment Corp.'s RSTS/E, RSX-IIE and VMS, Unix and S&H Computer Systems, Inc.'s TSX operating systems and features 256K bytes to 8M bytes of main memory.

According to the company, the system is available with the DEC Micro-11, PDP-11/23 Plus, PDP-11/24, PDP-11/44, PDP-11/73 or VAX-11 processor and is compatible with existing 18-bit direct memory access controllers or DEC Q-bus interfaces, as well as 22-bit devices.

Unitronix also announced that the system offers both DEC and non-DEC peripheral options.

Other features are said to include a port serial interface for up to 64 terminals, a peripheral bus mapping module, 18- and 22-bit LSI-11 backplane handling old and new controllers and communications options to multiplexer and modems.

The system reportedly runs DEC diagnostics, according to the vendor.

It is available with a 160M-, 300M-, 500M- or 800M-byte fixed Winchester drive and with an optional 80M-byte removable Winchester drive for backup, the vendor said.

The system is available now at prices ranging from $29,000 to $53,000, depending upon the desired central processor.

Unitronix, 197 Meister Ave., Somerville, N.J. 08876.

CAV CORP.
Cav/Cad

CAV Corp. has introduced Cav/Cad, a turnkey computer-aided design and manufacturing (CAD/CAM) system that uses a 32-bit Motorola, Inc. 68000 microprocessor and the Unix operating system.

The system offers three-dimensional CAD; multiuser, multitasking capabilities; automatic dimensioning and bill of materials generation; and menu-driven graphics production, according to the vendor.

A base CAD/CAM system consists of a 68000 microprocessor; 1M byte of random-access memory, expandable to 5M bytes; 30M bytes of hard disk storage, expandable to 500M bytes; a graphics terminal with 1,024- by 1,024-pixel addressable resolution or a 1,024- by 768-pixel viewable resolution; a 1M-byte floppy disk drive; six RS-232 ports, which can be expanded to 12 ports; and a digitizing tablet.

The system can be expanded to support six users, a Touch-Tone screen, tape storage and a modem, according to CAV.

The system price is $50,000.

CAV, 3130 La Selva Drive, San Mateo, Calif. 94403.

FOUR PHASE SYSTEMS, INC.
Low-end turnkey system

Four Phase Systems, Inc. has announced a low-end turnkey system which can accommodate up to eight terminals using the firm's Vision distributed data processing software.

The system was designed to address a variety of applications and configuration requirements of the small-scale office environment. It will include a complement of peripheral devices, data transfer capabilities and software offerings, the vendor said.

The system includes 96K bytes of processor memory and 5M-byte disk capacity. The CPU incorporates the vendor's proprietary architecture, featuring window into memory and interrupt-free display. Each terminal reportedly can handle more than 10 keystrokes/sec without any perceivable delay. The alphanumeric, key-punch-style keyboard was designed for data entry; IBM 3270 simulation and Videx, according to a spokesman.

The system is offered in two configurations: either with a bisynchronous communications controller or with a magnetic tape drive. A sample configuration consisting of a CPU, bisynchronous communications, eight terminals and keyboards and a line printer sells for $34,812.

Four Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

PROCESSORS

INTERNATIONAL TECHNOLOGY GROUP, INC.
Integrity system expansion

International Technology Group, Inc. (ITG) has announced the expansion of its Integrity computer system from 64- to 96-terminal capacity.

The system uses twin Data General Corp. Eclipse S/140 processors, each with 2M bytes of erasable correctable memory, and reportedly provides disk storage space of up to 2.4G bytes.

The Integrity operating system is compatible with Mini Computer Systems, Inc.'s Micos system. The ITG enhanced version of Micos Extensive Basic supports CALL routines, reducing a typical program size by 50%; offers Boolean logic to facilitate structured programming; and can address up to eight 600M-byte logical disk volumes, a spokesman for the vendor said.

The low-end, DG-based Integrity systems utilize single 128K-byte DG Nova series processors and support Control Data Corp. Lark II disk drives — 25M bytes fixed, 25M bytes removable, according to the vendor spokesman.

Nationwide hardware and operating system maintenance service is provided by ITG. All systems contain on-board diagnostics and are continuously monitored via ITG's remote support network.

Prices start at $175,000 for a dual-processor configuration with 64 terminals, ITG said.

ITG, 3 Barker Ave., White Plains, N.Y. 10601.

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OLDIES from page 73

can ignore technology. DP shops are changing at a much more rapid rate now. DP managers who used to plan on making hardware changes every five years are now making those changes in three. Larger shops say they re-evaluate their hardware needs every six months.

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SYSTEMS & PERIPHERALS

DATA STORAGE

CUSTOM SYSTEMS, INC.
BMX-1 disk controller

Custom Systems, Inc. (CSI) has introduced a disk controller, the BMX-1.

The BMX-1 is plug-compatible with the burst multiplexer channel on Data General Corp. minicomputers. According to the vendor, it allows users to select any storage module drive-interfaced disk drive for use with the DG S-140, S-280 and MV Series CPUs.

The product offers the user four disk drive connect ports with software-configurable drive characteristics on a port-by-port basis.

According to the vendor, the unit uses electronically erasable programmable read-only memory technology, eliminating the need for switches and making all functions configurable via downline loaded software.

The BMX-1 contains a 32-bit error correction code, offering burst error correction to 11 bits in length.

The list price of the controller is $4,995, with quantity discounts available.

Custom Systems, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

INNOVATIVE DATA TECHNOLOGY, INC.
Magnetic tape subsystems

Innovative Data Technology, Inc. has introduced three ½-in. 9-track, 800/1600 byte/in. magnetic tape subsystems for the Small Computer Systems Interface (SCSI) Bus.

The tape subsystems, which boast IBM/Ansi/Ecma compatibility, use an intelligent controller embedded behind two of the tape transports and in a stand-alone 3½-in. chassis when used with the streaming recorder, the vendor said. Variable data block sizes are programmable in both the read and write mode up to a maximum of 32K bytes of buffer storage, the vendor said.

The magnetic tape subsystems feature full hardware and software compatibility with any host unit or other peripheral supporting the SCSI standard bus, the vendor said. In addition, the subsystems control up to four ½-in. Industry Standard Tape Transports, and all of the systems may use 7-, 8½- and 10½-in. standard reel sizes, the vendor said.

Other features include a tape-to-tape copy feature which can be implemented in the software, and over 40M bytes of data may be stored on a single 2,400-ft reel of tape, the vendor said.

Model TD1012/SCSI, which sells for $4,550, supports 9 tracks and 1,600 bit/in. in the start/stop mode operating at 12.5 in./sec or 100 in./sec in streaming mode. The data transfer rate is 20K byte/sec in start/stop mode and 160K byte/sec in streaming mode, according to the vendor.

Model TD1050/SCSI costs $5,150 and supports 7- or 9-track dual density 800 bit/in. and 1,600 bit/in. in start/stop mode operating at 45 in./sec. The data transfer rate is 72K byte/sec, the vendor said.

Model TD1750/SCSI sells for $5,950 and supports 9-track dual density 800 bit/in. and 1,600 bit/in. in start/stop mode operating at 75 in./sec. The data transfer rate is 120K byte/sec.

As options, rack enclosures, factory installation and maintenance contracts are available.

Innovative Data Technology, P.O. Box 178160, 4060 Morena Blvd., San Diego, Calif. 92117.

TERMINALS

KIMTRON CORP.
ABM 85H VT-52/100

Kimtron Corp. has introduced a terminal that reportedly emulates Digital Equipment Corp. VT-52/100 CRTs.

The ABM 85H VT-52/100 features green or amber characters, a 24-line by 80-col. screen, 16 programmable function keys, programmable cursor, an RS-232 port, user-selected embedded attributes and four international character sets, the vendor said.

By using different programmable read-only memories, the terminal also reportedly emulates Televideo Systems, Inc. 920, 925 and 950 or Data General Corp. D100/200 terminals.

The terminal is priced at $895.

Kimtron Corp., 2225-I Martin Ave., Santa Clara, Calif. 95050.

GOULD, INC.
PC Workstation

Gould, Inc.'s Modicon Programmable Control Division has announced a documentation and drafting workstation said to be compatible with many models of programmable controllers.

The PC Workstation includes a 16-bit processor and 512K bytes of program memory and a 16M-byte Winchester disk drive with a 5¼-in. floppy disk drive, the vendor said. The product reportedly provides text ladder diagrams and user-customized drafting for programmable controller equipment drawings.

The workstation also reportedly combines fully-formed graphics symbols with extensive commentary to produce high-resolution, informative displays.

The PC Workstation, including high-speed printer and software, is priced from $21,000, according to the vendor.

Gould's Modicon Programmable Control Division, P.O. Box 83-SV3, Andover, Mass. 01810.

SYSTEMS & PERIPHERALS

PENTA SYSTEMS INTERNATIONAL, INC.
Pentavision enhancements

Penta Systems International, Inc. has announced enhancements for its electronic graphics terminal, Pentavision, designed for use by publishers, in-plant printing operations and commercial typesetters using Data General Corp. computer systems.

According to a company spokesman, the enhancements allow precise lineup of type in made-up pages in the computer-assisted page-makeup terminal.

Features include visual locks that align type to alternative positions beyond the normal locking, based on the line measure and the quadding specified during original input. It also is said to allow automatic contouring of text by tracing an outline of the desired shape on Pentavision's bit pad, use of electronic scissors for cutting the page into sections for output and justification of type by feathering between lines or elsewhere in the text.

The terminals cost $33,995, according to the vendor.

Penta Systems, 1511 Guilford Ave., Baltimore, Md. 21202.

KEY TRONIC CORP.
KB 100

Key Tronic Corp. has introduced KB 100, a plug-compatible replacement keyboard for the Digital Equipment Corp. VT100 CRT terminal.

The KB 100 is a low-profile keyboard requiring less vertical space than the terminal's original keyboard, the vendor said.

Additionally, the KB 100 is intended for heavy office use and incorporates a microprocessor and solid-state capacitive switches.

Cost of the plug-compatible replacement keyboard is $379.

Key Tronic, P.O. Box 14687, Spokane, Wash. 99214.

KIMTRON CORP.
KT-7

Kimtron Corp. has announced a video display terminal featuring what the company describes as an ergonomic design.

The KT-7 terminal reportedly features a tilt-and-swivel screen, height adjustability, a 12-in., nonglare green or amber screen, menu setups and user-selectable hidden or embedded attributes. The menu setups, 20 programmable function keys with answer-back, are set from keyboard or host and stored in nonvolatile memory, according to the company.

The terminal is said to emulate the Televideo Systems, Inc. 930, 910 and 925 terminals and to offer code compatibility with the Televideo 924, 914 and 950. It reportedly can emulate other terminals with the addition of an optional programmable read-only memory.

The terminal is available now for $595.

Kimtron, 2225-1 Martin Ave., Santa Clara, Calif. 95050.

DIGILOG, INC.
Remote Monitor Select Switch

The Network Control Division of Digilog, Inc. introduced the Remote Monitor Select Switch (RMSS), which reportedly allows users at a central location to monitor remote data circuits.

The system requires central and remote-site equipment. An Ascii terminal, master remote line monitor (RLM), data line monitor (DLM) and asynchronous modem are needed at the central site; the remote site requires a slave remote line monitor and RMSS. The Ascii terminal uses an RLM to monitor signal information. The signal causes RMSS to bridge the line so data traffic can be monitored by the DLM at the central site.

RMSS costs $325, which includes cables.

Digilog, 1370 Welsh Road, Montgomeryville, Pa. 18936.

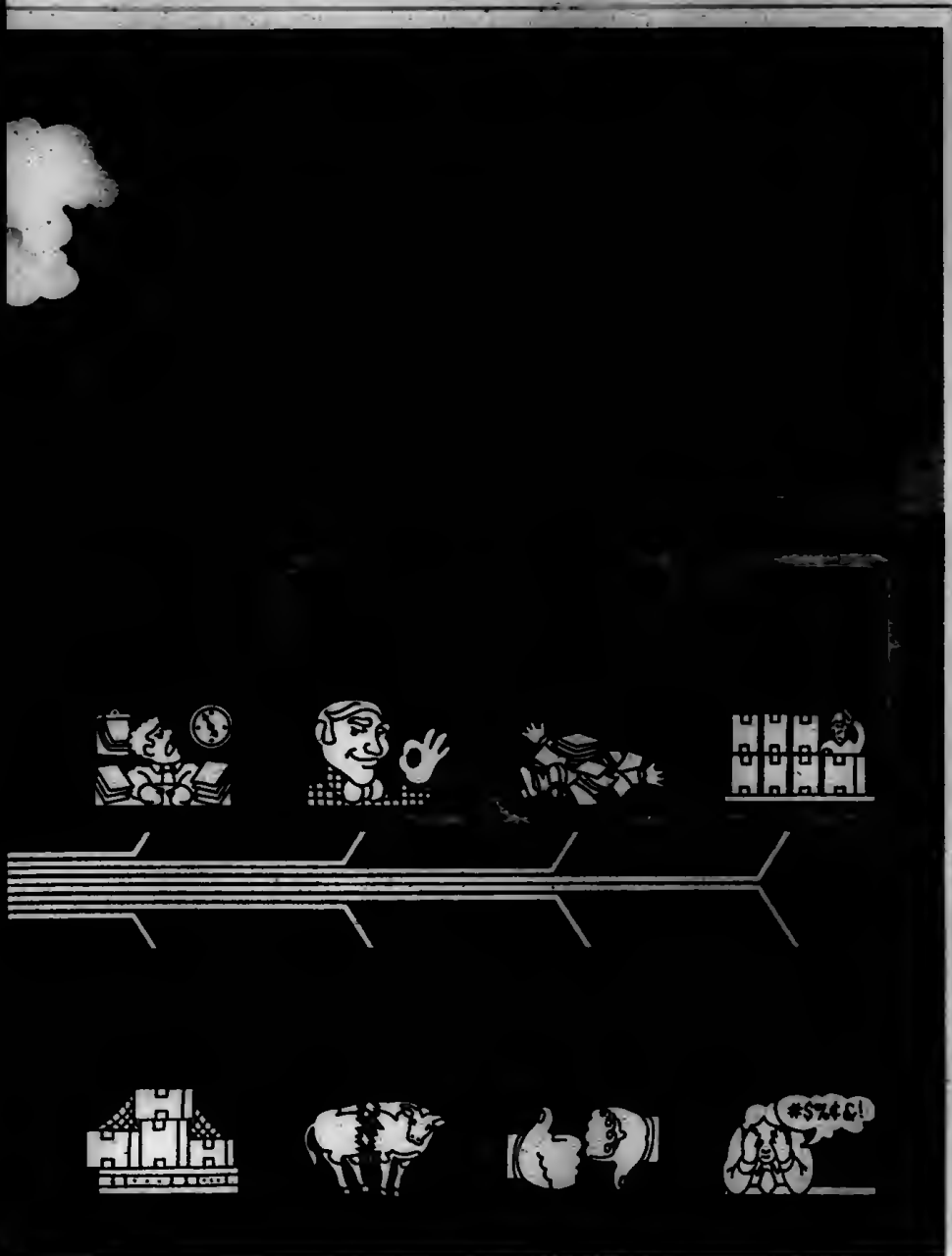
INTECOLOR CORP.
Fastscreen

Intecolor Corp. has introduced a computer memory facility said to permit displays to be created on its 8001G color graphics terminal screen in one-quarter of a second.

Since it uses random-access memory, Fastscreen reportedly provides faster access to information than do conventional, flexible-media storage devices for process-control operations. Any of 63 different screens can be displayed on 8001G color graphics terminals equipped with single Fastscreen with 512K-byte storage. Up to 126 screens are available with dual Fastscreen, which provides more than 1M byte of storage.

Fastscreen is supplied as a printed-circuit board for use in the Intecolor card cage. The price for single Fastscreen is $1,245; the dual version is $2,450.

Intecolor, Intecolor Drive, 225 Technology Park, Norcross, Ga. 30092.



SYSTEMS & PERIPHERALS

PRINTERS/ PLOTTERS

GOLD KEY ELECTRONICS, INC.
Switchmate; Switchmate Jr.

Gold Key Electronics, Inc. (GKE) has announced the development of an intelligent printer switch for use with Digital Equipment Corp.'s LQP02 printer.

Switchmate reportedly allows as many as three Decmate system users to share the functions of a printer without having to wait for current printer activity. The sharing can be suspended at any time and dedicated to a single Decmate.

The switch is attached by cable to the Decmate systems and the LQP02 printer. Also offered is the Switchmate Jr., which has a two-user capability.

The Switchmate retails for $749 and the Switchmate Jr. for $499. Service and a warranty period are provided by the vendor.

GKE, P.O. Box 29, 735 Chestnut St., Manchester, N.H. 03105.

GRAPHICS SYSTEMS

TENTIME
Graphics T/S service; Management Touch

Tentime has announced two services for Digital Equipment Corp. users: graphics time-sharing capabilities for DEC VAX-11 users and Management Touch, said to provide a DEC VT100 with touch-sensitive screen capabilities.

Using a California Computer Products, Inc. Model 1051 plotter, contour mapping, bar charts, pie charts and bubble charts reportedly can be produced under the graphics time-sharing service.

Graphics features include dc servomotor drive, continuous drum roll, four-color pen action and .25mm resolution.

Time-sharing costs are $78/hour plus materials and a 15% surcharge on all materials, according to a vendor spokesman.

Management Touch consists of a touch-sensitive screen and logic board for $1,095.

A yearly maintenance service is also available for $150.

Tentime, 5375 Western Ave., Boulder, Colo. 80301.

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POWER SUPPLIES

COMPUTER POWER SOLUTIONS, INC.
Electra-Guard

Computer Power Solutions, Inc. (CPSI) has expanded its line of electronic surge suppressors to include standby power supply systems.

The Electra-Guard standby power supply system comes in 200 Vac (optional 400 Vac) with an audible alarm and is sized approximately 6 by 11 by 13 in., a spokesman for the vendor said.

The unit itself is protected against line and battery fuses and a has a low battery cutout to protect against potentially damaging overloads, according to the vendor spokesman.

Suggested retail starts at $490.95 for the 200 Vac model.

CPSI, Suite 203, 8300 49th St. N., Pinellas Park, Fla. 33565.

TII ELECTRONICS, INC.
GPM-PX

TII Electronics, Inc. has enhanced its programmable power line monitor with a feature said to direct programming of power line fault thresholds by a front-panel keyboard.

The feature reportedly allows the operator to pinpoint fault conditions and to track and identify, via printout, power line problems such as high-line voltage, low-line voltage, voltage spike and drop, power failure and high-frequency noise.

Other features of the enhanced product, called GPM-PX, include a summary of events and threshold-setting capability, an RS-232 output, a dc high/low monitoring capability and spike amplitude window detection.

GPM-PX costs $1,950, the vendor said.

TII Electronics, 286 Terminal Road, East Setauket, N.Y. 11733.

SYSTEMS & PERIPHERALS

EDP POWER, INC.
Survivor

EDP Power, Inc. introduced the Survivor, a back-up power source for personal and small business computers.

The Survivor protects a computer from power flickers, power outages, line surges and brownouts, according to the vendor.

The product features automatic dc circuit breaker, two duplex outlets, a zero maintenance sealed battery and an automatic battery charger, the vendor said.

Three models provide 200, 400 or 1,000 watts of power and battery power that lasts 15 minutes or longer.

Prices for the Survivor back-up power source begin at $600, the spokesman said.

EDP Power, Suite 211, 1108A W. Devon Ave., Elk Grove Village, Ill. 60007.

EXIDE ELECTRONICS CORP.
Power Distribution Module

Exide Electronics Corp. has announced a line of power distribution systems for mainframe computers.

Exide's Power Distribution Module distributes and monitors power in a computer room, thus protecting it from voltage spikes, transients and other electrical surges, according to the vendor. The module has two options: metering and monitoring. The metering option displays output, voltage and other parameters, the vendor said. The monitoring module scans system parameters, stores 100 alarm conditions and provides printer or terminal interfaces, the vendor said.

The base system price starts at $3,760, a model with the metering option is priced at $4,800, and a module with the monitoring option costs $8,170.

Exide Electronics, P.O. Box 58189, Raleigh, N.C. 27658.

BOARD-LEVEL DEVICES

PRIVAC, INC.
Electro-Screen BT-1 2.0

Privac, Inc. has announced enhancements to its Electro-Screen BT-1 graphics board, designed for SS-50 and SS-64 buses.

Electro-Screen BT-1 2.0 enhancements reportedly provide 19.2K bit/sec character equivalent throughput, two-dimension output with scaling capability and rotation in one-degree increments.

Electro-Screen BT-1, equipped with a 6809 microprocessor, provides bit-mapped, 512- by 480-pixel resolution and 84- by 48-line text display, the vendor said.

The enhanced graphics board is priced at $795.

Privac, 3711 S. George Mason Drive, Falls Church, Va. 22041.

MOTOROLA SEMICONDUCTOR PRODUCTS, INC.
M68BSA1-1; M68BSA2; M68BSAC

Motorola Semiconductor Products, Inc. has announced support of its MC68008, MC68010 and MC68451 chips with a real-time bus state analyzer (BSA) and two additions to its series of personality modules.

The additions include:

■ The M68BSA1-1 — An MC68000, MC68010 and MC68451 personality module. The M68BSA1-1 is a redesigned version of the vendor's MC68000 BSA1 personality module. The new product supports the MC68000 and expands its support to the MC68010 virtual memory microprocessing unit and the MC68451 main memory unit. It has two cable and probe/connector assemblies.

■ The M68BSA2 — An MC68008 personality module. It supports the MC68008 microprocessing unit and has a cable and probe/connector.

Both of these personality modules require a third offering, the M68BSAC BSA control module.

The personality modules function with three BSA trigger modes (continuous trace, sequential and window) and provide address (software) and discrete (hardware) histogram displays, the vendor said. Also, the BSA1-1 and the BSA2 modules reportedly provide matching support for the MC6800, 68008 and 68010 emulator modes that are used in the vendor's HDS-400 hardware development station. Combined with the HDS-400, the BSA can provide complex event break points — specified by up to seven events from 79 qualifier lines — on other than program instructions.

Pricing for the control module and two personality modules is: $3,500 for the M68BSAC and $1,950 each for the M68BSA1-1 and M68BSA2.

Motorola, P.O. Box 20912, Phoenix, Ariz. 85036.

STD MICROSYSTEMS
Models 5370A and 5380A

STD Microsystems has announced two additions to its line of bus modules.

The Model 5370A is said to be a fully standard bus-compatible interface with Zilog, Inc.'s Z80 microprocessor.

The unit also offers a dual RS-232C serial interface. It contains two software programmable asynchronous or synchronous RS-232C serial channels with transmission rate selection and an optional crystal-referenced transmission rate oscillator, the vendor said.

The external RS-232C interface is configurable with data communications or terminal equipment and meets the requirements of RS-232C configuration F. The asynchronous configurations cost: $175 for 2.5 MHz, $200 for 4 MHz and $235 for 6 MHz. The synchronous configurations cost: $185 for 2.5 MHz, $210 for 4 MHz and $245 for the 6-MHz version, the vendor said.

Also unveiled was the Model 5380A Z80 dual parallel I/O module, also said to be STD-Z80 bus-compatible.

It reportedly provides four independent 8-bit I/O ports, two of which are capable of bidirectional I/O. The module has all bus signals fully buffered for minimum loading and maximum system expandability. The Model 5380A costs $150 for 2.5 MHz, $180 for 4 MHz and $210 for the 6-MHz version.

The STD bus interrupt daisy chain is implemented on board both modules, reportedly allowing serial priority interrupt arbitration within modules of the system.

STD Microsystems, 399 Sherman Ave., Palo Alto, Calif. 94306.

AUXILIARY EQUIPMENT

PERIPHERAL CONNECTIONS, INC.
E-Z-Reader

Peripheral Connections, Inc. (Percon) has introduced a bar code reader called E-Z-Reader, which supports the two most prolific industrial bar codes, 39 and interleaved 205, according to the vendor.

Communications are standard via an RS-232C port. There is a beeper to indicate a good read. Operator feedback is available by two LED host-controlled status indicators and a low-frequency tone, the vendor said.

The vendor said the product was developed for the customer who wants to read dot matrix or medium-density printed labels and have operator feedback.

The E-Z-Reader costs $395. An operating and installation manual is available for $20.

Percon, P.O. Box 1358, Eugene, Ore. 97440.

COMPUTRONICS LTD.
Forms Driver

Computronics Ltd. introduced Forms Driver, which supports Prime Computer, Inc. Forms software for Televideo, Inc. 925 and 950 and Hazeltine Corp. Espirit III terminals.

Forms Driver supports five types of cursors: blinking block, steady block, blinking underline, steady underline and none, the vendor said. The software allows the user to select the type of cursor used with Forms and when Forms is exited. Forms Driver supports reverse video and blinking characters, according to the vendor.

Forms Driver is available for a one-time license fee of $1,500 for each type of terminal.

Computronics, 150 North Ash, Wood Dale, Ill. 60191.

SWITCHMASTER CORP.
VS controller

Switchmaster Corp. has introduced a new control system for its line of IBM-compatible channel switches.

The VS controller includes specialized hardware and software to control a single channel switch as well as a network of channel switches.

The system reportedly allows up to 24 switches to be operated from a single CRT terminal.

The 800 series channel switch allows up to 16 strings of peripheral devices to be connected to as many as eight CPUs in any configuration, according to the vendor.

With the VS feature, the 800 can coexist in the same network with the previously announced 880 switch, the vendor said.

The switches range in price from $61,000 to $99,000.

The 800 switch reportedly includes the VS control system with a CRT terminal, but there is a charge of $3,900 for the feature when installed on the smaller switches.

Switchmaster, Suite 8, 35 Mitchell Blvd., San Rafael, Calif. 94903.

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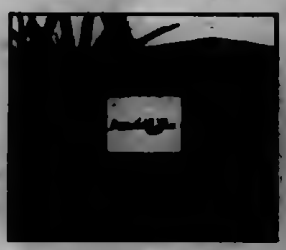

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MICROCOMPUTERS

Micro tools called short of user needs

By Peter Bartalik
CW Staff

PALM SPRINGS, Calif. — Microcomputer software is working some wonders in the corporate environment, but a lot more innovation is required, according to systems designers for four top U.S. corporations who spoke here recently.

Systems executives for General Electric Co., Bank of America Corp., McKesson Corp. and Aetna Life and Casualty Co. shared their expectations with information industry representatives attending Infocorp's 1984 Strategic Issues Conference.

"We've got to deliver real data to the user in terms that he can deal with it," according to Coby Dunn, vice-president of interactive corporate services for Bank of America.

Dunn said his centralized data processing functions serve 10,000 users worldwide, along with several thousand word processing users, from seven mainframes.

Projects currently under way at Bank of America's new End-User Computing Department are focusing on integrating personal computers into vertical markets and building an extract facility to enable users to extract the data they are demanding. "Users are trying to get data off systems that aren't designed to give data in that format," he said.

Center of expertise

Jeffrey L. Ehrlich, manager of systems architecture with GE, said his department serves as the center of expertise for GE's 250 separate businesses and is responsible for distributing information, establishing policy and guidelines and major acquisition approval, among other functions.

Micro applications software has improved, and vendors are becoming more professional, he said, but several problems need to be resolved: "me-too products — we don't need a Dbase that is 10% faster"; unfinished products that don't perform to claims; overpriced software; and the perception that popularity equals quality. Ease of use is low on the list, he added. "The bottom line is getting the job done."

See USERS page 84

CPU links top wish list

In poll of IBM micro users

By Paul Gillin
CW Staff

SAN JOSE, Calif. — Although most IBM Personal Computer users in large corporations believe their microcomputer acquisitions have been well worth the cost, they would like to see a faster machine and better provisions for connections to mainframes and other Personal Computers. Those are among the findings of a report released here recently by Strategic, Inc.

While most respondents said connections between Personal Computers and the mainframe and between individual Personal Computers are important, they indicated that no vendor yet deals effectively with both aspects of that communication. Most large users desire the connections to share expensive peripherals, programs and data, the survey said.

In order to deal with the problem, most users are actively considering purchasing a local-area network, the survey found. However, the report said no current local-area networks provide capabilities for efficient mainframe access, and most mainframes cannot function effectively as network controllers.

About two-thirds of the large users employ IBM 3270 emulation to access other systems, while over 36% wanted to use the Personal Computer strictly as a terminal. Over one-third wanted to use both computer and terminal capabilities.

The report surveyed 70 larger companies that use both the Personal Computer and at least one mainframe system and 100 smaller companies that use at least one Personal Computer and some other minicomputer or microcomputer. All of the organizations used at least one IBM Personal Computer.

Large seeks elite speed

Almost 90% of the large users stated that their Personal Computers allowed them to perform major applications faster; 83% said the micro improved work quality; and 80% said they had implemented applications that were not previously computerized.

However, 60% of the users indicated at least some interest in a faster version of the Personal Computer. Planned en-

See MICROS page 82

IBM micro strategy outlined

SAN JOSE, Calif. — IBM's business-based Personal Computer product line, including the Personal Computer XT, 3270 Personal Computer and Personal Computer XT/370, will be significantly enhanced over the next two years and phased out entirely by 1987 in favor of much more powerful products. IBM will also settle on an expensive price umbrella, under which all other vendors will compete.

Those are among the predictions contained in a report on the Personal Computer market released recently by Strategic, Inc. The report predicted that the high-growth phase for Personal Computer products will end by 1986, after which IBM's products will settle into a comfortable 20% growth rate.

The IBM price umbrella will be larger and higher for future products, largely because IBM's Independent Business Unit, which originally designed the products, has been absorbed into IBM's Entry Systems Division and will now bear the burden of higher research and development overhead, the study said. However, increasing price/performance pressure from plug-compatible vendors and major competitors will force Big Blue to improve performance to avoid losing market share.

IBM's 3270 Personal Computer and XT/370 effectively have no competition, and the company still controls the large

See STRATEGY page 82

Docutel/Olivetti releases IBM Personal Computer-compatible micro/86

Datamension enhances Report Manager spreadsheet/83

INSIDE

- Toshiba bundles software into new micro/83
- Apogee out for Microsoft Xenix/86
- QDP multiuser micro runs Turbodos/87
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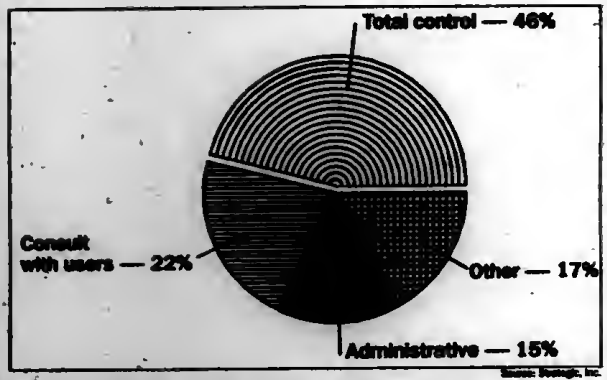

Source: Strategic, Inc.

DP department control of IBM Personal Computer acquisitions

MICROS from page 81

hancements include better printers, enhanced memory, graphics plotters and communications hardware and software.

File sharing between Personal Computers was cited as a need by over 75% of the users. In addition, 85% of the large users share their IBM Personal Computers among two or more people. In most cases, a primary user kept the computer in an office and secondary users occasionally employed it.

Most of the users in either type of organization were middle-level managers, the report stated. In large companies, purchase, installation, training and service are handled mainly by the DP department. Large companies also tend to purchase more complete systems than smaller companies, with over 70% of these configured with two floppy drives or 10Mbyte disk drives. The report anticipated that over 60% of the large users who need access to central data files will install 10M bytes or more of hard disk capacity.

Twenty-five percent of the respondents cited spreadsheet analysis as their primary application. Financial applications and word processing were cited by about 15% of the large users.

Lotus Development Corp.'s Lotus 1-2-3 and Visicorp's Visicalc were the most popular application packages.

The report, "IBM PC User Reactions, Requirements and Plans — 1984," is priced at $950.

Strategic, P.O. Box 9747, San Jose, Calif. 95157.

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corporate market, the survey noted. Most competitors will be forced to compete in sales to smaller firms.

Main push

IBM's main push in 1984 will be with the 3270 Personal Computer, which will be promoted in IBM MVS and VM operating environments. The XT/370 will be enhanced this year to allow it to interact more effectively with mainframe systems, the report predicted. A possible improvement to the 3270 Personal Computer would be a menu-driven IBM TSO interface. Future versions of IBM's 3274 terminal could include a network controller supporting networks of 3270 Personal Computers and XT/370 workstations, the study said. Future versions of the XT/370 will probably feature larger disks and peripherals, as well as better integration of the VM/PC operating system within IBM PC-DOS environments.

The XT/370 is a strategically important, but technically weak, product that is seriously hampered by its limits of 416K bytes of physical memory in 370 mode and maximum performance of .1 million instruction/sec, the report stated. There is little integration of the XT/370 with the host processor.

However, the XT/370 continues IBM's push to make the mainframe the center of the information processing system and represents an effort to establish IBM as a leader in the personal workstation arena, the survey noted.

Toshiba unveils T300 updates

TUSTIN, Calif. — Toshiba America, Inc. has announced the enhancement of its 16-bit T300 Personal/Business Computer and its release as a system with bundled software.

The T300 Computing System reportedly features as software Microsoft, Inc.'s Multiplan and Softword Systems, Inc.'s Multimate. The standard system is said to include 192K bytes of random-access memory with an Intel Corp. 8088 microprocessor.

The enhancements reportedly include an option for Microsoft's MS-DOS operating system 2.0 Release 2.

The system is available for $3,000.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.

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Arete Systems comes out with microcomputer

SAN JOSE, Calif. — Arete Systems Corp. has announced the Arete 1000 microcomputer. The high-performance system reportedly utilizes the strengths of various microprocessors to achieve performance levels of more than 2.8M instructions/sec.

According to a company spokesman, the microcomputer was developed in response to marketing research that found most high-end computer companies provide more hardware than is effectively utilized within the system. That excess hardware increases cost and lowers reliability.

Three separate buses implement the Arete 1000 architecture. Up to four Motorola, Inc. 68000 microprocessors share a common main memory, which may be as physically large as 16M bytes. Main memory is accessed via a 32-bit processor memory bus. With the system's tightly coupled CPUs, the Arete 1000 achieves extremely rapid dynamic load leveling between processors, the vendor said.

The system is able to store and retrieve large amounts of data on as many as 60 terminals simultaneously from a common data base. The Arete 1000 is thus able to perform large jobs that have always been reserved for large minicomputers and small mainframes, the vendor claimed.

Mass storage is provided by an 80M- or 160M-byte Winchester technology Fujitsu Ltd. disk drive and an Archive Corp. 45M-byte streaming cartridge tape drive. To deal with the problem of fault tolerance, there is 100% redundancy in all electromechanical systems. Components such as the CPUs, less prone to failure, are not duplicated, the vendor said.

Prices range from $46,950 for the Model 1114, which includes one 68000 CPU, 16 serial ports, 2M bytes of random-access memory, 180M bytes of hard disk memory and 48M bytes on a streaming tape. A larger 1200 series unit costs $102,450. Model 1200 configurations include four 8800 CPUs, 60M bytes of random-access memory, 64 serial ports, 320M bytes of hard disk memory and 48M bytes on a streaming tape, the vendor said.

Arete Systems, 3040 Hertog Drive, San Jose, Calif. 95131.

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At McKesson's divisions, according to Charles C. Hoerner, manager of office systems in the Information Services Division, similar problems exist as at GE and Bank of America. Additionally, he said, "Very often what [users] ask us for is not really what they need . . . [and] the tools that are introduced into the equation redefine the needs."

J. Curtis Roberts, director of systems architecture with Aetna, said that by the end of the decade his company expects to have some type of terminal on the desk of each of its 56,000 employees.

Before that can happen, Roberts said, it is necessary to meet several needs: communications innovations and standards to handle document interchange between personal computers and workstations "so the Personal Computer on my desk can look at and manipulate the document my secretary prepared on her workstation"; inexpensive and easy-to-install local-area networks for micro-to-micro file sharing and peripheral sharing; ease of use; multitasking of basic everyday applications; integrated software; and interfaces to mainframe host software.

All four executives said their companies have arranged for some type of discount program for employees to purchase micros for personal use. The day Bank of America announced the discount program, Dunn said, 1,100 orders were placed by employees.

NCR COMTEN INTRODUCES
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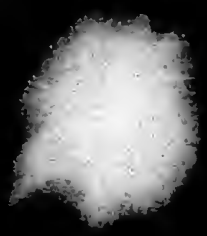

Olivetti unwraps IBM-compatible micros

Olivetti portable computer

IRVING, Texas — Docutel/Olivetti Corp. has announced portable and desktop personal computers that are compatible with IBM Personal Computers.

The Olivetti personal computer is available in three desktop versions and two portable versions. The systems reportedly include video displays, detached keyboards and bundled tutorial and application software.

According to a spokesman, the products are capable of running most popular business applications software written for the IBM Personal Computer and use Intel Corp. 8088 microprocessors and the IBM PC-DOS operating system. They reportedly also can run on several other operating systems.

They are said to feature 12-in. green monochrome screens in the desktop models and 9-in. screens in the portable versions, with 640-by 325-pixel displays, reverse video, underlining, blinking and two levels of character intensity.

The standard versions, the DT-1 and P-1, are said to feature 128K bytes of memory and a single 320K-byte floppy disk drive. Models DT-2 and P-2 are said to include an additional floppy disk drive, while the desktop model, DT-HD, contains a floppy disk drive and a 10M-byte hard disk system.

The computers feature the vendor's Ram Disk, on which random-access memory can be isolated to function as an electronic disk drive for quick access.

The systems reportedly include built-in serial and parallel ports, internal disk drive controllers and video display interfaces.

Bundled application software is said to include Micropro International Corp.'s Wordstar word processing system, Infostar data base system and Calcstar spreadsheet program.

Suggested retail prices are $2,895 for the DT-1 and P-1, $3,295 for the DT-2 and P-2 and $4,995 for the DT/HD.

Docutel/Olivetti, Office Products Division, 106 Decker St., Irving, Texas, 75062.

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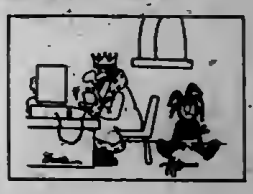
'Appgen' fits Xenix

HOUSTON — The Software Express, Inc. has announced a version of its Appgen applications generator package designed for use with Microsoft Corp.'s Xenix microcomputer operating system.

The Appgen applications generator is said to develop bug-free, self-documenting software and modify existing software to meet user needs. Appgen reportedly prompts the user through a series of English-language instructions, employing a menu-driven system that enables nontechnical programmers to develop applications packages.

The Xenix operating system, according to a spokesman, is compatible with most industry-standard microprocessors, including the Intel Corp. 8088, the Zilog, Inc. Z8000 and the Motorola, Inc. 68000. The Xenix version of Appgen is priced at $6,000.

The Software Express, Suite 220, 10103 Pondrea, Houston, Texas 77096.



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SYSTEMS

QDP COMPUTER SYSTEMS
QDP-400

QDP Computer Systems has announced the QDP-400 multiuser system based on Software 2000's Turbo DOS operating system and designed for increased system throughput.

The system features a standard 6 MHz Zilog, Inc. Z80B CPU for its master CPU and a Z80A CPU for each of the two to five individual slave CPUs, the vendor said. The QDP-400 master CPU has up to 256K bytes of random-access memory available, with 128K bytes for each of the user workstations.

The system is compatible with Digital Research, Inc.'s CP/M and MP/M operating systems and offers Turbo DOS memory and disk management and, when combined with QDP's bank-switched memory, provides more user storage, fast buffering and faster loading of programs and files, the vendor said.

Its configuration program allows the QDP-400 system to be used with most terminals, printers or modems. The system also features over 30M bytes of Winchester hard disk storage and a 1.2M-byte, 8-in. floppy disk with programmable drive shutoff, the vendor said.

Advanced QDP system features include an on-line Help program, a menu program, a hard disk format, system status and a hard disk diagnostic program, according to the vendor.

Prices for the system start at $9,995.

QDP, 10330 Brecksville Road, Cleveland, Ohio 44141.

ALPHA MERICS CORP.
Datascribe 5

Alpha Merics Corp. has introduced the Datascribe 5, a microcomputer-based drafting system.

Datascribe 5 replaces the Datascribe IV and features an interface that supports both RS-232C and IEEE-488 protocols.

With the interface, the Datascribe 5 can be used as a stand-alone, keyboard-driven system for applying lettering or symboling to drawings or as a computer plotter, according to the vendor.

Also included in the product is a software emulation program that makes the Datascribe 5 compatible with application programs written to drive Hewlett-Packard plotters, the vendor said.

According to the vendor, the product can "expedite preparation of schedules, charts, posters, formats, signs, parts lists, simple schematic diagrams and view graphs.

Datascribe weighs 29 lb and has a printing area of 16 in. by 39 in. Character heights are adjustable from 1/16 in. to 3½ in.

According to the vendor, users without computer-aided design (CAD) systems would be able to upgrade to any CAD system at any time.

Customers with CAD systems gain the benefits of a stand-alone Datascribe system and the advantages of a high-quality, low-cost flat-bed plotter, a company spokesman said.

The suggested retail price of Datascribe 5 is $8,450.

Alpha Merics, 20931 Nordhoff St., Chatsworth, Calif. 91311.

APPLIED INSTRUMENTATION CORP.
Scout

Applied Instrumentation Corp. (AIC) has announced a stand-alone field microcomputer that measures hydrological, geotechnical and meteorological variables.

The Scout is a compact, battery-operated (three-month life span/battery) micro capable of storing approximately three months' worth of stand-alone measurements, recordings and control of multiple sensors. For example, a standard Scout with three sensors each recording every half hour and having 12K bytes of random-access memory (RAM) would record 48 sample/day on each sensor. At this rate, it would take 40 days to fill the RAM, a spokesman said. After expanding the same system to 56K bytes of RAM, it would take 200 days to fill the memory.

The Scout runs on the vendor's proprietary operating system and comes with 64K bytes of memory and up to four sensor interface cards, which support multiple channels of 4- to 20-mA current loop, 5V single-ended and mV differential, as well as digital I/O and supply sensor power. It has built-in RS-232C and current loop serial interfaces. All electronics are housed in one sealed enclosure and operate over a temperature range of -35 C to 65 C.

The user communicates with the Scout via any compatible hand-held terminal, and the cassette tapes are compatible with the Apple Computer, Inc., Apple II or IBM Personal Computer.

The Scout package, which includes the first interface card, a terminal and audio cassettes, costs $2,950.

AIC, P.O. Box F196-168, Blaine, Wash. 98230.

CMA MICROCOMPUTER
Computerized bulletin board

CMA Microcomputer has announced a computerized bulletin board service.

The service will allow users to share information, resolve problems and receive updated versions of the firm's applications packages, the vendor said.

Upon installation of the service, the vendor's Technical Center will be open to service users 24 hours a day during the business week. Users who

Continued on page 88

Large systems hardware is not an impulse buy.

Now there's a guide coming to you that will help with your homework.

The *Computerworld Buyer's Guide to Large System Hardware* is designed to give you a valuable, one-stop information source for large systems hardware and peripherals. Take a look at all the tools it will give you to help you make the right large systems choice:

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MICROCOMPUTERS

Continued from page 87

are unable to call during regular business hours will be able to dial the service and leave a message for a technician. The technician will then prepare an answer or solution for the user and leave it on the message service. The service allows users to pick up updates when available or recover files which may have been lost due to hardware failures, the vendor said.

The extended service is free to users of the company's applications packages, which range in price from $49.95 to $1,700.

CMA - Microcomputer, 55723 Santa Fe Trail, Yucca Valley, Calif. 92284.

VISION-80 PTY., LTD.
Five products for Apple II and IIe personal computers

Vision-80 Propriety, Ltd. has announced a series of five products for Apple Computer, Inc. Apple II and Apple IIe personal computers.

The Vision-80 circuit board plugs into the Apple motherboard, allowing a display of 80 columns of text with applications such as word processing, terminal emulation, data base and electronic spreadsheet, the vendor said. It costs $195.

The Vision 128/256 memory expansion card is said to be fully buffered with low power consumption and capable of replacing the 16K-byte random-access memory card used in many Apple IIs. It costs $295.

The Vision-VCE is a preboot disk for use with the Vision-80 board, allowing the user to see 80 columns of display with Visicorp's Visicalc. It costs $60.

Vision-AWII is said to be a preboot disk for Apple's Applewriter II word processing program, providing an 80-col. display when used in conjunction with the Vision-80 board. It costs $60.

The Vision-128 utility disk reportedly contains a variety of utility programs designed to take advantage of the extra memory of the Vision-128. It costs $79.

The products are available now through Vision-80 Pty., Ltd.'s U.S. distributor, Action Research Northwest.

Action Research Northwest, 11443 Marine View Drive S.W., Seattle, Wash. 98146.

NEC HOME ELECTRONICS, INC.
New PC-8800 prices

NEC Home Electronics, Inc. has announced new bundled prices on its PC-8800 8- and 16-bit desktop personal computer systems.

The Smart Small Business package sells for $1,999 and the Middle Manager package for $2,499.

The first package features the PC-8801 8-bit CPU and keyboard with 64K bytes of random-access memory (RAM), the PC-8831 5¼-in., 640K-byte dual disk drive and the following 6-bit software: Wordstar and Mail Merge by Micropro International Corp.; Microsoft, Inc.'s Multiplan; Digital Research, Inc.'s CP/M 2.2; and two Microsoft Basic programming languages.

The Middle Manager package includes the PC-8801 8-bit CPU and keyboard with 64K bytes of RAM, as well as the PC-8801A-16 16-bit card with 128K bytes of RAM and Microsoft's MS-DOS operating system, the PC-8831 5¼-in., 640K-byte, dual disk drive and the same software as the Smart Small Business package.

According to the vendor, both packages are available with an 8-in., 2M-byte dual disk drive for an additional $800.

The PC-8800 system features high-resolution monochrome (640 by 400 pixels) and color (640 by 400 pixels) graphics. The detachable keyboard features a numeric key pad, five user-programmable function keys supporting 10 different functions and editing keys.

NEC Home Electronics, 1401 Estes Ave., Elk Grove Village, Ill. 60007.

CLM/SYSTEMS, INC.
Unifier System

CLM/Systems, Inc. has announced the Unifier System, which is said to be a computer system for civil engineering, surveying, mapping, construction and utility organizations.

The multiuser, multitasking system includes a Sage Computer Technology Sage Super Microprocessor with 1M byte of random-access memory, an 18M-byte hard disk, floppy disk, two to four graphics terminals/workstations, multimode printer, plotter and interactive digitizer, according to the vendor.

Software, including an operating system, data base manager, word processor, spreadsheet, utilities and the complete CLM Cogo applications software package, is provided with the Unifier System.

The Unifier System costs under $35,000.

CLM/Systems, 9654 Gandy Blvd., Tampa, Fla. 33611.

DATA TECHNOLOGIES INDUSTRIES
Assistant CP/e

Data Technologies Industries has announced Assistant CP/e, an Apple Computer, Inc. Apple IIe-compatible

Continued on page 89

PROFESSIONALISM IS A COMMITMENT CERTIFICATION IS THE TEST

The 23rd Annual Examination for the CERTIFICATE IN DATA PROCESSING (CDP) has been scheduled for Saturday, May 5, 1984, at test centers throughout the world. Offered by the Institute for Certification of Computer Professionals (ICCP), the CDP certification program is directed primarily at business-oriented data processing people at the management and supervisory level.

If you are truly committed to professionalism, the CDP examination offers you an opportunity to validate your basic data processing knowledge and provides you with self confidence and a sense of professional identity in the data processing field.

CDP Examination content is updated each year, so give yourself time to review your knowledge in the field by mailing in the coupon below today. Application deadline is March 1, 1984.

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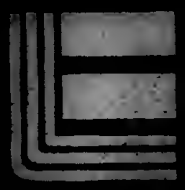

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MICROCOMPUTERS

Continued from page 90

microcomputer which can also run programs written for Digital Research, Inc.'s CP/M operating system.

The product features Zilog, Inc. Z80 and MOS Technologies, Inc. 6502 microprocessors, 64K bytes of random-access memory, a single-side, single-density disk drive, 14-lb weight, a monochrome monitor with 280- by 192-pixel resolution and a Centronics Data Computer Corp. parallel port. The microcomputer will bundle word processing and personal management software.

Assistant CP/e costs $1,595, a spokesman said.

Data Technology Industries, 701-A Whitney St., San Leandro, Calif. 94577.

STORAGE

AMDEK CORP.
AMDC-I; AMDC-II

Amdek Corp. has introduced two 3-in., microfloppy disk drive systems compatible with Atari, Inc. 400, 800 and XL series computers.

The AMDC-I, a single drive, provides up to 180K bytes of double-density, on-line formatted storage capacity.

The AMDC-II, a dual-drive, offers up to 360K bytes of double-density storage per side. The full capacity can be accessed by the user manually flipping it over, the vendor said.

According to the vendor, both units have an integral intelligent controller that is compatible with the Atari microcomputers.

Both units control up to four disk drives, each programmable for single- or double-density operation. The controller includes an Atari-compatible printer/plotter port.

According to the vendor, the two units may be used in conjunction with a 5¼-in. disk drive for Atari-compatible software.

The suggested retail price for the AMDC-I is $500; the AMDC-II is $660. The 3-in., double-sided cartridge is priced at $6.00.

Amdek, 2201 Lively Blvd., Elk Grove Village, Ill. 60007.

WINCHESTER SYSTEMS, INC.
Datasafe-S; MDS-256

Winchester Systems, Inc. has announced an 8M-byte Winchester disk system for the Intel Corp. Intellec Series II and III and the Mohawk Data Sciences Corp. MDS-800 microprocessor development system. It is said to be compatible with Intellec's operating system, Isis-II.

The Datasafe-S, based on a 5¼-in. disk drive, reportedly provides twice the system throughput of floppy drives. With 5M bytes of formatted storage capacity, the hard disk system has 39,168 blocks allocated in two directories.

The system offers a data transfer rate of 625K byte/sec with an average access time of 85msec. Drive mean time between failures is rated at 11,000 hours. Power consumption is 120W at 115/230 Vac line voltage. The Zilog, Inc. Z80-based controller includes 32-bit error-correction code with 11-bit burst error correction, the vendor said.

A print spooler option allows printing while programming, the vendor said. Its 256K-byte buffer holds about 60 to 80 pages.

Datasafe-S costs $4,995 and has a one-year warranty. The MDS-256 print spooler option costs $1,250, also with one-year warranty, the vendor said.

Winchester Systems, P.O. Box 545, 14 Laurel Hill, Winchester, Mass. 01890.

BOARD-LEVEL DEVICES

ADVANCED MICRO DEVICES, INC.
Am94/2000; Am94/1530; Am94/1541

Advanced Micro Devices, Inc. has introduced a Multibus-compatible

Continued on page 92

Can you answer these questions on local area networks the way you would have two years ago?

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If you've got communications products our readers should know about, then you need to get your ad reservation in by February 2nd. The materials are due one week later on February 9th. To reserve ad space in the March 14th issue of *Computerworld On Communications*, call one of the sales offices listed below, or call Ed Mrazek, National Sales Director at 617-879-0700.

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Continued from page 80

SBX motherboard with six SBX connectors, as well as two SBX modules — a stepper-motor controller and a dual-channel serial communications controller.

The Am94/2000 motherboard's six SBX connectors provide support for single- and double-width modules not requiring direct-memory access. The motherboard also includes on-board Intel Corp. Multibus address decoding and data buffering and Multibus/SBX timing reconciliation, as well as two of the firm's Am8259A programmable interrupt controllers. The on-board SBX connectors can handle any 8- or 16-bit SBX module and provide for up to six single-width modules, one double-width and four single-width modules or two double-width and two single-width modules, the vendor said.

The Am94/1530 is a programmable dual-channel serial communications module. Enabling the designer to add incremental I/O capability to a Multibus system, the unit adds two RS-232C serial channels to any host board that includes an SBX bus-compatible connector.

Incorporating the Z8530 serial communications controller, the Am94/1530 module handles a variety of communication formats, including asynchronous, binary synchronous, IBM High-Level Data Link Control and Synchronous Data Link Control protocols, the vendor said.

The Am94/1541 stepper motor controller is a programmable, single-width SBX module. Through its on-board 8-bit microcontroller integrated circuit, it can drive one four-phase stepper motor via either a program stored in the microcontroller or commands sent from the CPU board. A line is provided for an external clock to synchronize several Am94/1541s so that multiple stepper motors can be controlled synchronously. Also included in the module are buffered lines for external feedback from the devices controlled by the Am94/1541.

The single-quantity price of the Am94/2000 SBX motherboard is $495, while both the Am94/1530 dual-channel serial communications module and the Am94/1541 stepper motor controller cost $305 each.

Advanced Micro Devices, 901 Thompson Place, Sunnyvale, Calif. 94086.

MICROTEK, INC.
Price reductions

Microtek, Inc. has reduced the prices of its entire line of add-on products for Apple Computer, Inc. microcomputers.

Among the reduced products is a 128K-bit memory card, formerly $479, now available with Digital Research, Inc.'s CP/M operating system and Pascal enhancement diskettes for $299. The Q-Disc, a 128K-bit, solid-state disk emulation card supplied with CP/M and Pascal enhancement disks, Visicorp's Visicalc spreadsheet program expansion software and Artsci's Magicalc spreadsheet program, has been reduced from $529 to $399.

In addition, the Dumpling-GX graphics printer card now costs $89.95, down from $175. A complete pricing schedule is available from the company.

Microtek, 4750 Viewridge Ave., San Diego, Calif. 92123.

PROFIT SYSTEMS, INC.
Multigraph

Profit Systems, Inc. has announced the Multigraph board, a graphics board for the IBM Personal Computer.

The board works with either monochrome or color monitors. It features soft scrolling, 720- by 350-pixel resolution, 32K bytes of random-access memory and flicker-free scrolling, according to the vendor. The board runs software written for an IBM color board without requiring a color monitor. An option allows the use of a 132-col. monitor.

The board costs $499.

Profit Systems, P.O. Box 1039, Berkley, Mich. 48072.

AUXILIARY EQUIPMENT

COMPUCABLE CORP.
IBM micro screen

Compucable Corp. has announced an enhancement screen for the IBM Personal Computer.

The screen enhances char-

NEW FROM CINCOM:
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MAINFRAME PERSONAL COMPUTING POWER WITH DP CONTROL.

acter display and eliminates reflection and glare, according to the vendor. The screen's material consists of woven, black, optical-fiber mesh. The screen is housed in a polycarbonate frame, which reportedly eliminates electronic shock. A foam gasket around the frame holds the screen in place, while a pull tab on the frame's bottom is used for removing the screen.

The product costs $24.95.

Compucable Corp., Suite 6-J, 1440 South State College Blvd., Anaheim, Calif. 92806.

MICRO SOFTWARE

DATAMISSION CORP.
Report Manager

Datamission Corp. has announced a new release of Report Manager, a three-dimensional, programmable spreadsheet for the IBM Personal Computer.

Enhancements exchange data between Report Manager and other software packages; sort columns, rows or pages; expand local and global formatting; support color monitors; and use full-word command prompts, according to the vendor. Twelve exec program statements and 11 additional preprogrammed functions have been added to the program, the vendor said. Reportedly, files created with the first version of the program are compatible with the latest release.

Report Manager costs $495.

Datamission, 615 Academy Drive, Northbrook, Ill. 60062.

I.P. SHARP ASSOCIATES LTD.
Sharp APL/PC

I.P. Sharp Associates Ltd. recently announced the implementation of its Sharp APL development language in a package for the IBM Personal Computer.

Sharp APL/PC, according to a company spokesman, is compatible with Sharp's mainframe software products. The package reportedly incorporates all features of Sharp APL for mainframes.

The package for the Personal Computer runs as a user program under IBM PC-DOS operating system Versions 1.1 or 2.0. It includes the interpreter, file system, session manager, several auxiliary processors and utility software. Auxiliary processors reportedly provide access to the operating system, DOS files, asynchronous communications, the parallel printer and a full screen manager.

The package, including diskettes containing Sharp APL/PC and utility programs, APL stickers for the Personal Computer key buttons and manuals, costs $375 and will be available in the first quarter of this year. An APL-character read-only memory, enabling the Personal Computer to display APL characters, costs $25. A Sharp APL package for the IBM XT/370 will be available in the third quarter of 1984.

I.P. Sharp Associates, Suite 1900, 2 First Canadian Place, Toronto, Ont., Canada, M5X 1E3.

SOFTWARE DIGEST, INC.
Software ratings

Software Digest, Inc. has announced the availability of a newsletter that rates IBM Personal Computer software.

Programs are tested by 10 evaluators, then scored to produce ratings on each. Word processing program testing has been completed. Data base management systems and graphics programs are planned in the near future, the vendor said.

Newsletter rates range from $90 for a six-month trial series to $240 for a two-year subscription.

Software Digest, 1 Wynnewood Road, Wynnewood, Pa. 19096.

MANAGE USER SERIES

Cincom's new MANAGE USER SERIES™ combines the benefits of personal computing capability, mainframe power and greater data processing control into one comprehensive Decision Support System.

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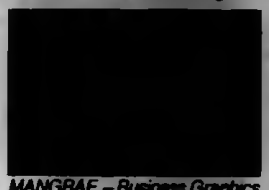
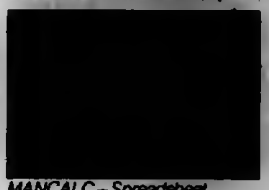
- MANCALC is a 3-Dimensional electronic spreadsheet that facilitates "corporate-size" models and can automatically load information stored in corporate files, or build models based on private data as well.
- MANTIS is Cincom's industry acclaimed application development language. As the "integrator" of the MANAGE USER SERIES, MANTIS provides an effective bridge between the Development Center and the Information Center.

MANTEXT – Text Processing



MANGRAF – Business Graphics



MANCALC – Spreadsheet

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For more information on MANAGE, or any of our new integrated software technologies, simply contact the Cincom Marketing Services Department, 2300 Montana Avenue, Cincinnati, Ohio 45211.

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COMPUTER INDUSTRY

DEC airs rise in earnings
After five quarters of decline

MAYNARD, Mass. — After five straight reports of declining earnings, Digital Equipment Corp. will announce today that earnings for the second quarter ended Dec. 31 exceeded results from the same period one year ago.

The company issued a preliminary report Jan. 13 which indicated that, prior to an audit review, earnings for the quarter would fall between $1.20 and $1.45, compared with the $1.06 figure of the corresponding quarter one year earlier. One financial analyst told *Computerworld* that part of the improved earnings may be attributed to increases in personal computer shipments and shipments of other equipment that were delayed during the first quarter of the present fiscal year.

Beginning in October 1982, the company disappointed the stock market with the first of five successive quarterly reports showing reduced earnings in comparison to year-earlier results. The disappointment culminated in last October's announcement that first-quarter earnings had plunged 72% to a dismal $15.9 million, or 26 cents per share [CW, Oct. 24, 31]. The first-quarter shortfall was linked by the company to lower than expected shipments of personal computers, delayed shipments of high-end peripherals and administrative problems.

The second quarter figures are significantly higher than had been predicted by Wall Street analysts, who had forecast earnings ranging from 26 cents per share to 90 cents per share.

DEC officials would not comment in detail on the unofficial results, but Alfred M. Bertocchi, vice-president for finance and administration, said the company had experienced strong customer demand for its VAX-11/780 superminicomputers, MicroPDP-11s, personal computers and office products.

Stephen K. Smith, an analyst who follows the company for Paine Webber Mitchell Hutchins, said the DEC announcement was certainly a good surprise, even if it

See DEC page 96

Intel, AMD semi sales booming

With recent announcements of its quarterly sales and earnings, Intel Corp. joined the $1 billion-plus vendor group, and Advanced Micro Devices, Inc. (AMD) continued its strong expansion, as semiconductor sales boomed.

Santa Clara, Calif.-based Intel closed out its fourth quarter and fiscal year posting sales of $1.1 billion, a 25% jump over 1982's annual total and the first time the company surpassed the $1 billion sales level. Intel's profit for the year increased threefold to $116 million or $1.05 per share, compared with earnings of $30 million or 32 cents per share, last year.

For the fourth quarter, Intel's sales climbed 39% to $332 million, compared with $239 million the same period a year earlier. Profit in the quarter was $47 million or 40 cents per share, 40% of the company's total profit for the year.

Commenting on Intel's performance, Gordon E. Moore, chairman and chief executive officer, said, "Our business outlook for 1984 is very strong, as the deluge of orders that hit us last June shows no sign of abating."

Quarterly sales and profit at AMD, for the company's third quarter, again surpassed previous highs. Sales totaled $154 million, 66% greater than the same period last year. Profit for the Sunnyvale, Calif., firm totaled $20 million or 35 cents per share, a better than threefold increase over the third quarter of last year.

Like other semiconductor companies reporting financial results in recent weeks, AMD reported record-setting research and development spending and lengthy order

See PROFITS page 103

IBM/Unix foster speculation

While it came as no great surprise, IBM's announcement of Unix support on its Personal Computer line has fostered divergent speculation on just what the announcement means — to IBM, AT&T and the user community at large.

On the face of it, it looks as though, with widespread Unix acceptance, IBM could in time find itself in the pitiful position of its plug-compatible manufacturers, namely, at the mercy of AT&T-launched updates of the operating system, particularly as its usage proliferates among larger systems. If anyone knows the market power of the company holding the keys to the instruction set, it is IBM.

So why get behind the eight ball? The answer is that IBM has not, and it may, in fact, end up looking a lot rosier than AT&T in the Unix game.

Welcomed relief

For one thing, IBM's endorsement of Unix, albeit token, will come as a welcomed relief to the growing legions of Unix aficionados. Their numbers are relatively small now, but bear in mind that Bell Laboratories has made Unix a fairly cheap tool for university use. According to International Data Corp., 90% of computer science majors in the U.S. (50% in Europe) have been exposed to Unix as a result.

Judging from comments passed at last fall's meeting of the Association of Data Processing Management Organizations, Inc., there is some animosity in both the Unix user and the third-party vendor communities toward AT&T, animosity that could work to IBM's great favor now.

Speaking at the meeting were the current and future heads of the Unix users group. Bob Marsh, chairman of Plexus Computers, Inc., claimed that AT&T has been an obstructionist force in the move-

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Texas Instruments is sitting atop the merchant semiconductor heap/103

MCI

Earnings are flat but capital spending is booming at MCI/96

INSIDE

■ Does IBM have two standards of industry conduct?/97

■ A rainbow coalition of industry groups is attacking some taxing problems/98

■ Erasable optical disks are on the way, but will take a few years getting here/100

■ DG's financial performance leads the minicworld/101

■ Things looking up at Honeywell/101

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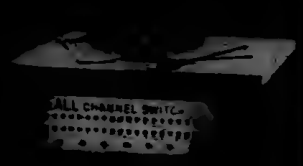

John Beall & Company

IBM from page 95

want to promote Unix as an industry standard. In fact, the old Western Electric did not support Unix a year ago. In particular, Marsh knocked what he considered AT&T's onerous Unix licensing fees — in the neighborhood of $43,000 for the first copy and another $25,000 or so for redistribution rights.

'Enlightened view' urged

IBM's Unix endorsement "would be more valued," Marsh said at that time, adding that it was "just an accident" that AT&T owns the Unix rights. Both he and Mike Florio, also from the users group, called upon AT&T to adopt a more "enlightened view" toward Unix development. Each, however, doubted he would get want he wanted from AT&T in the near future.

But as a standard-bearer, IBM is second to none, even if the product is not IBM's to start with. The chances are good for those disenchanted with AT&T's Unix position that IBM will appear as a white knight, doing for the marketing of Unix as a standard what they say AT&T would not.

Meanwhile, IBM is not about to get locked into a Unix world of its own making. While IBM's endorsement will make third-party Unix vendors very happy, IBM doubtless has proprietary operating systems plans of its own for its low- and mid-range multiuser systems of the future. In the absence of any AT&T presence in the systems market at this time, IBM still calls the tune for the third-party software developers.

Most likely, IBM will gather as much of the Unix market as it can, particularly as it bolsters its thrust into the automated office, while trying to control the pace of Unix acceptance by keeping the third-party software vendors and the user community occupied with other systems. ■

The General Electric Co. high-tech rumor mill was working overtime again this month, this time piping sounds that the cash-rich giant was considering buying none other than Digital Equipment Corp. The result, of course, was an upward spike in DEC's stock price, boosted even further by the good financial news from the No. 2 computer maker.

The fact is, given the approximately $6 billion in cash and liquid securities now hoarded by GE, the company can afford any U.S. computer company but one, IBM. The fact is, that DEC is but one of a string of companies named in recent months as possible takeover candidates.

Add Hewlett-Packard Co., Data General Corp., Gould, Inc. and Prime Computer, Inc. to the list. And in virtually every case, the initiation of a takeover rumor has provoked a buying spree in the allegedly courted company, despite there not being one shred of evidence that GE ever talked with any of the companies.

One wonders what the stimulus for all this rumor mongering might be. It is entirely possible that, by the time this column runs, GE could own DEC. But it is unlikely, notwithstanding DEC's relatively cheap stock price right now. Why blow the entire wad on one company, to whose systems the rest of GE would be ostensibly committed, when GE can buy several, smaller, high-growth firms or even large pieces of bigger firms, not unlike what IBM has done with Rolm Corp. and Intel Corp.?

And as far as the acquisition of HP is concerned (which would cost about as much as DEC — $4 billion to $5 billion), it seems that Mr. Hewlett and Mr. Packard have very little to gain at this stage of their lives in liquidating interest in the company they founded in a garage back during the Depression. The smart money is taking the GE rumors at face value.

DEC from page 95

was "still not tremendous."

Smith said he believes DEC revenues for the quarter were up 25% to 26% over the previous year. Some of that increase can be attributed to equipment shipments that had been deferred during the first quarter, he said. Accounting for catching up on the previous delays, revenue growth for the current year should be about 20% to 21% ahead of last year, he added.

Software available

DEC will probably report shipments of 30,000 personal computers for the quarter just ended, according to Smith, compared to just 19,000 in the previous quarter. "There is software available now, and [DEC is] offering free maintenance," Smith said.

The news may not be quite so good for the third quarter, in Smith's view. "I think quarter three [earnings] will be below quarter three last year. [DEC] has built up [its] expenses; [it has] added 2,500 to 3,000 employees," he said.

DEC was also the latest company to be involved in rumors of an imminent takeover by General Electric Co., according to a Boston newspaper.

Mark A. Steinkraus, director of investor relations, issued a flat denial of such a prospect. "I don't know of any discussion between the two companies," Steinkraus said.

With about 58 million shares issued, DEC's street value, based on the $78 per share closing value the day the company issued its preliminary report, is about $4.5 billion. The company does not appear to be very closely held, with founder and president Kenneth H. Olsen, the largest single shareholder, owning slightly more than 4% of issued shares, or 2.4 million shares, according to the latest financial report.

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Celestial Software Inc.
Cermetek Microelectronics
Compaq Computer
Computercraft
Computer Intelligence
ComputerKnowledge Corp.
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Computerworld
Computex Corporation
Contemporary ComputerWear
Corona Data Systems
Corvus
CPU Corporation
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ESC Technologies, Inc.
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Software Automation Inc.
Software Centre International
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Sorbus Service Division MAI
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United Networking Systems Inc.
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(Exhibitors as of Dec. 15, 1983)

Is IBM qualified to set all industry standards?

OUTSIDE LINES

BOB DJURDJEVIC

A modern version of a Greek tragedy, complete with sacrificial victim, has been unfolding in U.S. courtrooms on both coasts since last November.

In Connecticut, IBM filed suit against The Gartner Group, Inc., a Stamford, Conn.-based market research company, and the same day settled the case. In California five days earlier, IBM added a former Gartner employee, who was also an ex-IBMer, to the list of defendants in its civil lawsuit against National Semiconductor Corp. and its subsidiary, National Advanced Systems, Inc. (NAS).

Without admitting liability, The Gartner Group agreed to return any IBM "protected information" it may still have; to identify to IBM all persons who might have disclosed or may in the future disclose such information; and to cooperate with IBM in any investigation of disclosure.

Why did IBM continue litigation against an individual after it had forced his employer to its knees? Why had IBM waited so long to file the charges against him? How did IBM obtain evidence against him?

An IBM spokesman refused to comment about the case "since the matter is before the courts." The plaintiff's lawyer has advised his client to remain mum for the time being, too. But NAS President David Martin sees this as yet another IBM effort to make an example out of the individual's case. "IBM is on a self-appointed mission to clean up the industry to their set of standards," he said.

No wonder IBM's adversaries are giving up, when even a federal judge commended the parties in the IBM/Hitachi Ltd. case for their wisdom in arriving at a settlement. "This could be an industrywide standard for a dispute resolution," the presiding judge said.

The consequences of such settlements may also affect innocent observers. Let us assume one meets an IBM employee who voluntarily begins to spill the beans about his employer. If IBM were to act consistently, the listener, and not just the IBM employee, could be found "guilty" by IBM's standard if he did not report this incident "forthwith" to IBM.

In the past, many people have volunteered to assist IBM if the company's legitimate trade secrets were being threatened. But it is one thing to let each individual act in accordance with his conscience and another to have IBM tell you (as in the Gartner settlement) that you "shall notify IBM forthwith" and "shall cooperate with IBM's reasonable requests in an investigation of the circumstances."

If you were a journalist, for example, this could mean IBM has just put you out of business. Is IBM, therefore, attempting to extend its power not just over its employees and competitors, but also over the press and other third parties?

None of this is to take away IBM's right to protect its own trade secrets. But if new standards of business conduct are needed, such issues should be decided by our elected representatives and the industry as a whole, not just by a single competitor pointing a gun at the head of its adversaries.

How qualified is IBM for this self-appointed role? Is IBM itself above reproach?

A Phoenix-based law firm, Brown & Bain, was retained in 1981 by National Semi for another alleged trade-secret violation case. This case was settled in June 1982. Two months later, Brown & Bain advised National Semi that it would be acting for IBM, its old client, "in the pending dispute between National and IBM."

Ultimately, National Semi/NAS lawyers managed to get this law firm disqualified from the case. Though the court said there was no indication of unethical attitudes or practices as far as Brown & Bain was concerned, one cannot help wondering about IBM's business judgment, if not its motives, in retaining counsel which it knew had just concluded a case acting for the opposite side.

Or consider the preannouncement hype of the PCjr and the System/34. Media articles hurt IBM competitors' sales, as some buyers held back on their purchases until the IBM products were finally unveiled. The level of detailed product information which the press reported left little doubt that the source of that information must have originated inside IBM. Yet this time there were no lawsuits. No IBM employees were fired to set an example, at least as far as the public is aware.

Could it be that such information leaks are condoned, if not intentionally planted, if they serve IBM's purposes? If so, doesn't that make IBM a company with double standards? And if that's the case, is that the kind of company that should assume the role of setting the industry's business conduct rules?

Djurdjevic is president of Annex Holdings Corp. of Phoenix and publisher of the Annex Computer Report.

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Plus, we'll present personal computer experts from around the nation in an up-to-the-minute conference program. You'll learn how to choose and how to use the technology and equipment surrounding the PC family of microcomputers. Here's a partial listing of the conference sessions:

Wednesday, February 1, 1984
User Sessions:

The Benefits of the IBM PC for Small Businesses
Financing Options and Tax Advantages
Available Add-Ons and Peripherals
Software: What's Available and How to Find It
What Do the Compatibles Have To Offer?
How I Became Compatible With My IBM PC
Medical/Dental Applications for the PC
The PC in the Law Office
PC's and Real Estate
Manufacturing Resource Planning with the PC
Investment Software for the PC
CPA Software: The Bottom Line
Software for Insurance Applications
Distributed Control Software for the PC

Thursday, February 2, 1984
User Sessions:

The Anatomy of the IBM PC
Defining Levels of Compatibility Between Systems
Overview of Compatibles: Desktops and Portables
Word Processing Software
Database Management Software
Business Graphics Software
Analyzing Your Software Requirements
Overview of Major Business Applications Software
Integrated Software Solutions

Friday, February 3, 1984
User Sessions: The PC in the Corporate Environment

Review of Policy and Planning Issues
Implementation Strategies
Use of PC to Mainframe Communications (Includes Security Issues)
Local Networking for the PC

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High-tech trade groups press for R&D bills

SAN JOSE, Calif. — As the U.S. Congress convenes this month to begin its election-year deliberations, a rainbow coalition of powerful, high-technology trade associations is pressing the Reagan administration to beef up its support for permanent tax incentives for their members.

With the current research and development tax credit provision due to expire at the end of next year, the Semiconductor Industry Association, together with the American Electronics Association, the Computer and Business Equipment Manufacturers Association and the Scientific Apparatus Makers Association, is seeking passage of the High Technology Research and Scientific Act now before Congress.

The act's companion bills — S. 2165, introduced in the U.S. Senate by Sen. John Danforth (R-Mo.), and H.R. 4475, sponsored by Rep. James Shannon (D-Mass.) — are intended to enhance and make permanent the R&D-tax credits included in President Reagan's 1981 Economic Recovery Tax Act and to improve the level of scientific education in U.S. colleges and universities.

The ad hoc group had prepared a study, "High Technology Tax Policies for the 1980s," which was to be presented in Washington, D.C., last week.

The study, prepared over the last year, contended essentially that many current tax policies are not well suited to aid in the economy's transition toward an internationally competitive technology-based economy.

"World leadership in the semiconductor industry is dependent in the long term on continuous innovations and an adequate supply of qualified scientists and engineers," Tom Hinkelman, president and executive director of the SIA, remarked. "Passage of this act will contribute substantially to our industry's ability to help to keep the U.S. in the forefront of technological innovation."

According to the four trade associations, the proposed act provides enhanced incentives for investment in R&D by expanding the current laws allowing tax credits for increased research activities and corporate funding of basic university research and by making the R&D tax credit a permanent part of the tax laws.

Hinkelman also called for swift action on the proposal, claiming that the election year hoopla will detract Congress from pressing legislative matters.

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MCI posts flat earnings

WASHINGTON, D.C. — For the first time in several quarters, MCI Communications Corp. has posted flat earnings, attributing the results to heavy capital spending as the company prepares to compete with an unregulated AT&T.

MCI showed profits of $43.6 million, or 19 cents per share, for the fourth quarter, compared with $43.5 million, or 22 cents per share, for the same quarter a year earlier. Revenues in the period jumped 47% to $430 million, compared with $294 million a year ago.

For the year, MCI earned $203 million, or 89 cents per share, a 34% increase over last year's $151 million profit. Sales for the year totaled $1.5 billion, an increase of 67% over fiscal 1982.

Increased spending for communications lines leased from other long-distance competitors, which permitted MCI to offer customers interstate calling regardless of whether the call terminates in a city on the MCI network, also had a negative effect on the quarterly bottom line, the company said.

"The increased expense . . . is part of a strategy to build MCI's market share as rapidly as possible in anticipation of equal access," commented V. Orville Wright, president and chief executive officer.

Gould plans to sell division

ROLLING MEADOWS, Ill. — Gould, Inc. is planning to sell its $25 million Power Conversion Division as a further move to focus its holdings more specifically on electronics, the company announced recently.

The company said the division's products are not strategically critical to its primary business base in computers, factory automation systems and other electronic components.

Gould declined to speculate on possible suitors for the division or on its asking price, saying only that the company has held discussions with several companies.

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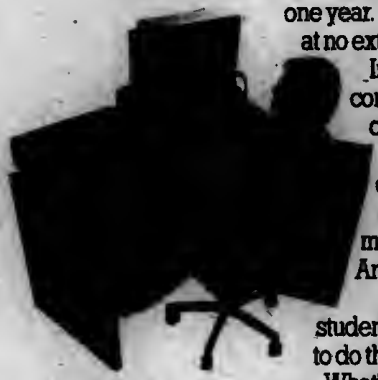

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Exec views storage mart

PALM SPRINGS, Calif. — Erasable optical storage products will enter the market in 1987 and will impact both the high end and low end of the present magnetic storage market, according to Peter Lloyd, vice-president and general manager of Shugart Corp.'s Optimem Division.

Speaking here earlier this month at a session of Infocorp's 1984 Strategic Issues Conference, Lloyd predicted that 1984 "is the year of evaluation of (nonerasable optical) products by system companies and integration into the end-user market," and that 1985 will see a large volume of such products.

In 1986, he continued, will come the introduction of optical storage workstations.

Nonerasable optical storage, either read-only or write-once, will find a willing market because of high-storage capacity, user-friendliness and because there are many applications where erasability is not required, Lloyd said.

High-end hardware users will use nonerasable optical storage for its "greater off-line storage access" and comparatively low cost, he claimed, adding that the products will eventually replace tape libraries. Low-end hardware users will use the products for image storing and the ability to access large amounts of data at low costs, he continued.

Optical storage, in Lloyd's view, will follow the same trends as magnetic storage: lower cost, higher performance and smaller size. But, he added, reductions in cost and size will be faster than experienced by magnetic storage.

IEEE edition available

SILVER SPRING, Md. — The Institute of Electrical and Electronics Engineers (IEEE) has announced the availability of the fourth edition of its best-seller, *Tutorial: Software Design Techniques*, edited by Peter Freeman and Peter Wasserman, both of the University of California.

The edition includes 47 papers, 22 of which did not appear in the previous edition, and captures the latest ideas in software design, IEEE said.

Major enhancements include Freeman's original paper, "Fundamentals of Design," along with coverage of user interface design, object-oriented design, design of concurrent systems and integration of design into software development methodologies, IEEE said.

The book has been published for analysts, designers, programmers and managers seeking a broader perspective of software design, as well as for classroom use in software engineering courses.

The 736-page *Tutorial: Software Design Techniques* is priced at $20 for IEEE members and $32 for nonmembers.

IEEE, Suite 300, 1109 Spring St., Silver Spring, Md. 20910.

Hughes plans satellites

WASHINGTON, D.C. — Hughes Communications Galaxy, Inc. has hatched plans for a $450 million private satellite communications system designed to operate in a heretofore unused frequency band and to provide six times the communications capacity of existing domestic satellites.

Hughes has requested authority from the Federal Communications Commission to build, launch and operate two satellites that will function at 20 and 30 GHz, with the first satellite to be launched in late 1988. Both satellites' designs will be based on the Intelsat VI spacecraft Hughes is building for the Intelsat consortium.

The satellites' 5,000-lb payloads will provide 3,000 channels, each capable of transmitting one full-motion videoconferencing call or the equivalent amount of wide-band data service.

"The millimeter-wave technology needed to build this new generation of communications satellites has been developed for two decades here and elsewhere," commented Albert D. Wheelon, chairman of Hughes.

"The technology is ready now for commercial application . . . the lower frequency orbital positions are being filled rapidly, and it is timely to move ahead with a millimeter-wave system," according to Hughes.

IBM micro seen costly

SAN JOSE, Calif. — The IBM Personal Computer with a local-area network connection is too expensive to be used by more than a fraction of the office work force, according to a recently released report from Strategic, Inc.

In a study titled "Multi-User, Multiprocessor Computer Systems: Impact and Opportunities," the research and consulting firm concluded that a Personal Computer costing $3,000 to $4,000 with local-area network connections is not competitive with the offerings of vendors such as

Convergent Technology, Inc., Burroughs Corp., Molecular Computer, Inc. or NCR Corp.

"Today, with a multiuser microprocessor system supplied by these companies, it can cost less than $2,000 to put a workstation on an employee's desk and to be able to share data and costly peripherals among all the workstations," asserted Michael Killen, president of Strategic.

The report forecast the market for multiuser microcomputers, including Personal Computers and local-area networks, multiprocessors and shared-processor systems, will grow from $448 million in 1983 to $5.9 billion in 1987.

The report is priced at $1,500.

Strategic, Box 9747, San Jose, Calif. 95157.

DG reports strong gains

For first quarter

WESTBORO, Mass. — Citing continued growth in both orders and shipments, Data General Corp. reported strong gains in sales and profits for its first quarter that ended Dec. 17.

Sales totaled $220 million, a 22% jump compared with the same period a year earlier.

Profits jumped nearly threefold to $9 million, or 36 cents per share, compared with profit of $3 million, or 14 cents per share, last year.

Mini demand continuing

According to Edson deCastro, DG's president, an increase in demand that began last summer for the company's minicomputer line has continued, as has the economywide increase in capital spending.

"If this trend in capital spending continues, I am optimistic about DG's prospects for strong growth," he commented.

"Sustaining that growth will depend not only on the continuing improvement in customer orders, but also on the availability of raw materials and components, primarily semiconductors," deCastro maintained.

Olivetti airs merger plan

DALLAS — Docutel/Olivetti Corp. has announced a consolidation and reorganization designed to streamline marketing operations for the company's office and financial product lines.

The reorganization combines the former office products and financial systems divisions into a single entity. The company said that, with the consolidation, it will institute three marketing-support units. The newly created customer service and telemarketing groups will work directly with office product dealers, while the third group, field marketing, will include automatic teller machine and terminal product sellers.

Approximately 60 positions will be eliminated as a result of the consolidation. John J. Douglas, company president, said the changes are steps in a long-range program to mesh the office products and financial systems operations into a single profitable organization "by concentrating personnel in key support and operations areas."

Honeywell sees profits

MINNEAPOLIS — Honeywell, Inc. announced Jan. 17 a 15.2% profit increase for fiscal year 1983 in comparison to the previous year. Profits from the Information Systems Division increased by $51 million over the same period, "largely as a result of aggressive cost-saving efforts."

Total profits for the fourth quarter ended Dec. 31 increased by only $3.9 million over the $86 million reported for the corresponding period one year ago.

Income for the year ended Dec. 31 was $231.2 million on revenues of $6.7 billion; the previous year, the company had reported total net income of $206.6 million on revenues of $5.4 billion.

Edson Spencer, chairman and chief executive officer of the company, cited a sharp improvement in the company's computer business and a significant reduction in interest expense as the major reasons for the improved earnings.

Honeywell's Aerospace and Defense Division also reported a profit increase, $22 million, over the previous year, but the Control Products and Control Systems Divisions reported profit decreases of $23 million and $52 million, respectively.

The Information Systems Division, however, experienced a reduction in total yearly revenues of $19 million; Control Systems also reported reduced revenues, while the other two divisions increased revenues.

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COMPUTER INDUSTRY

SUPERSHORTS

Computervision Corp. has signed an agreement with **Investeck, Inc.** and **Richard Mather & Associates, Inc.**, under which the companies will jointly develop, market and support space and facilities planning software designed to meet the needs of architects, space planners and facilities managers.

■

The Ultimate Corp. has signed a four-year contract with **Bull Group, Paris**, under which Bull will supply Ultimate with up to $28.8 million of minicomputer systems. Bull will provide Bull Mini 6 systems, which are based on Honeywell, Inc. DPS 6/level 6 minicomputer systems, for distribution by Ultimate's international network of independent dealers.

■

Honeywell, Inc.'s Communication Services business has been elevated to divisional status. **M.L. Jackson**, who has served as director since 1980, has been promoted to vice-president and general manager of the new division.

■

Perception Technology Corp. (PTC) has announced an agreement with **AT&T Information Systems, Inc.** calling for the inclusion of PTC's Interactive Data Entry/Voice Response System in proposals by AT&T Information Systems to its customers for call-management systems. PTC will supply equipment directly to interested customers.

■

American Software, Inc. and **Pratech Research and Development Partnership** have announced the formation of a joint venture under which American Research, a subsidiary of American Software, will perform research pursuant to the development of two new application software products. The new products will be an accounts receivable system for IBM mainframe computers and manufacturing management application software for the IBM System/38.

■

Fujitsu Ltd. and **Texas Instruments, Inc.** have signed an alternate source agreement under which Fujitsu will supply semiconductor design and fabrication information to TI. Fujitsu has the option of using TI's computer-aided design tools for its gate arrays.

■

The **Hall L. Hibbard Computer-Aided Aerospace Design Facility** has been established at MIT through gifts from **Perkin-Elmer Corp.** and **Cadam, Inc.**, a subsidiary of **Lockheed Aircraft Corp.** Dr. Jack L. Kerrebrock, Richard Cockburn Maclaurin Professor of Aeronautics and Astronautics and head of MIT's Department of Aeronautics and Astronautics, said Perkin-Elmer has donated hardware and Cadam has donated software for the center. Each company gift is valued at about $250,000. Lockheed is providing a $50,000 operating fund for the first five years.

■

Ridge Computers, manufacturer of 32-bit personal computers, is offering discounts totaling $4 million on its computer systems to universities and national research laboratories. Under Ridge's special year-long "Commitment to Education" program, the first 100 universities and/or national research laboratories that qualify can buy a Ridge 32 computer for $19,900, a discount of 66% off the regular list price.

■

IBM recently donated $2.8 million to more than 1,100 colleges and universities under its IBM Matching Grants Program for Higher Education, bringing 1983 contributions to $10.8 million, up 20% over a year ago. For every dollar IBM employees and their spouses contribute to approved degree-granting colleges and universities, up to $5,000 per donor per college annually, IBM contributes two dollars to the educational institutions.

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PROFITS from page 05

backlogs.

"Record R&D spending in the [third] quarter exceeded the $100 million annualized rate for the first time . . . and for the year to date was 18.5% of sales," said W.J. Sanders, chairman and president. "Pretax and net profit margins of 18% and 13%, respectively, were the highest since the 1974-75 recession."

Sanders said that new orders at AMD rose 30% in the quarter to $302 million, compared with the previous quarter, with this growth led by orders for microprocessors and telecommunications products.

Adapso names board

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. (Adapso), representing 650 software and service companies, has announced its slate of officers and directors for 1984.

Doug Altenbern, chairman and president of Endata, Inc., has been named board chairman, while Arthur Kramer, managing partner of Arthur Kramer & Co., was reelected vice-chairman.

Other officers include: George Raymond, president of Automatic Business Centers, treasurer; Fred Lafer, general counsel of Automatic Data Processing, chairman of the executive committee; and George Shea, corporate counsel of National Data Corp., vice-president of government relations.

Also named were Jay Goldberg, president of Software Design Associates, vice-president of competitive practices; J. Allen Hufft, president of University Computing Co., vice-president of educational and informational services; John P. Imlay, chairman of Management Science America, Inc., vice-president of image.

Wang posts strong sales

LOWELL, Mass. — Wang Laboratories, Inc. continued on its strong and steady growth track in its second fiscal quarter, posting earnings and sales gains of nearly 40%.

Sales for the quarter totaled $515 million — in excess of $2 billion on an annual basis — compared with sales of $367 million in the same period last year. Profits for the quarter jumped to $48 million, or 35 cents per share, a 38% increase over last year.

In addition, new orders increased 34% to $618 million. The company reported that the earnings and sales gains were consistent with its business plans and were achieved "despite increased competitive pricing practices within the industry, which continued to affect profit margins adversely." The company further reported that a strong U.S. dollar reduced overseas profits, as 40% of Wang's sales are made abroad.

Wang recognizes need to coexist

Study analyzes leading OA vendors

FRAMINGHAM, Mass. — "Wang [Laboratories, Inc.] will never be, for all the users in its served markets, ' "the only office automation company you'll ever need," ' according to a report recently released here that analyzed the strategies of four leading vendors in various segments of the office automation market.

The first of two parts, "Major Vendor Strategies in the Electronic Office — Part 1," by Framingham, Mass.-based International Data Corp. (IDC), focused on Wang Laboratories, Inc., Digital Equipment Corp., IBM and Xerox Corp.

IDC prefaced its report with a qualifier: "Ranking in OA is a little like establishing suspension bridge records: define the relevant universe closely enough, and virtually any span can be the longest or tallest."

Nevertheless, the report did settle on a number of conclusions: IBM, in OA, as in virtually every other market, intends to be number one; DEC, which has billed itself as the Number 2 computer vendor, similarly intends to become the Avis of OA; Wang is still working to establish its claim as "the office automation company"; and Xerox "continues to search for a winning office strategy."

While Wang, at the end of 1982, had captured 51.4% of the installed base in the clustered word processing market, according to IDC, Wang has realized it will never be the only OA company for its customers and "must be able to coexist with systems that it will encounter in the larger world — that is to say, live with IBM." Wang dominated the markets of word processing and small business computers, but according to IDC, those markets are shrinking, and the company that made it being where IBM was not "cannot afford not to succeed in becoming a full-line office automation vendor."

IBM, according to IDC, "has set a goal of being the Number 1 player in the markets it enters, and there is no single compelling reason why this will not be the case in the office." However, IDC countered, users will "discover that there is still a long way to go before the diverse range of IBM devices is capable of genuinely unrestricted communication . . . IBM has gone too far along too many different paths to offer a uniform and relatively consistent set of office products."

'Ranking in OA is a little like establishing suspensions bridge records: define the relevant universe closely enough, and virtually any span can be the longest or tallest.' — IDC report.

IBM has already committed itself to a coherent office strategy, with integration riding the backs of Document Content Architecture and Document Interchange Architecture protocols being developed and publicized to permit document transfer among dissimilar devices, IDC concluded. While these protocols do not meet the criteria of a multiproduct-line, uniform user interface, other vendors will continue to develop their products along IBM's standards, according to IDC.

DEC's thrust into OA, with the introduction of its All-in-One software less than two years ago and a much-noted internal reorganization, has begun to sway the perception that the company could only deal with highly technical computer professionals, according to IDC. But perception remains the "primary strategic challenge" and will require a protracted and expensive marketing and promotional effort on DEC's part, IDC said.

Xerox, according to IDC, "does not seem to be nearly the force to be reckoned with that it did even 18 months ago." A "strategic drift" and lack of new products has seen the company lose momentum as a total systems supplier for the electronic office, the report said.

Part two of the report will include Data General Corp., Hewlett-Packard Co. and others, including a number of software companies.

IDC, 5 Speen St., Framingham, Mass. 01701.

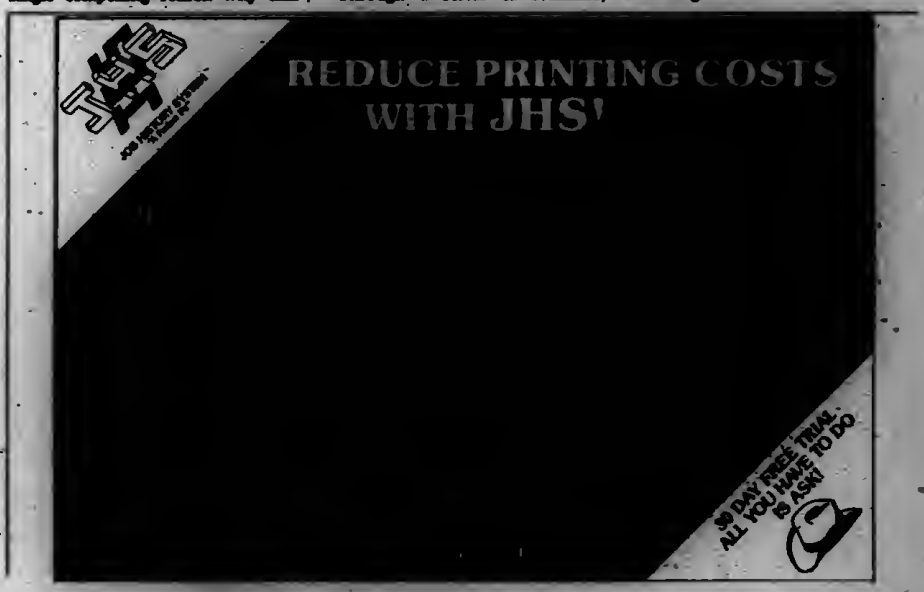
China-U.S. tech exchange set

SPOKANE, Wash. — A delegation of U.S. computer graphics specialists has been selected to conduct a three-week technical exchange with counterparts in the People's Republic of China.

Peter C. Wang, president of Automation Technology Institute, Inc. of Pebble Beach, Calif., has been named delegation leader, according to the People to People Citizen Ambassador Program, which selected the delegates and is sponsoring the exchange.

Through a series of seminars, meetings and on-site visits in several Chinese cities, the delegation of specialists will examine China's progress and needs in computer graphics technology, focusing particular attention on automated production, maintenance and retrieval of engineering data and the more traditional research areas.

Founded in 1956 by President Eisenhower to further international understanding, People to People International is now chaired by President Reagan.



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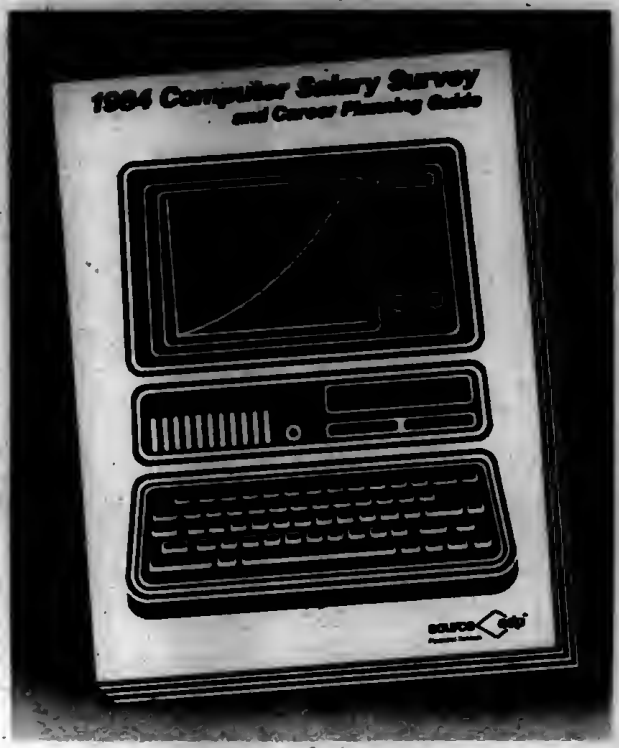

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Work directly with our clients, in product support and assist them with any problems or questions that may arise. A minimum of 2 years experience with MVS BCP internals is essential as is good communications skills and the ability to deal professionally with people of all levels. Knowledge of multiple CPU related software, preferably MSI, MSM or GCD would be a major asset. Some travel to SHARE, CMG and GUIDE meetings is also necessary.

You will find that being a member of our team is highly rewarding. We offer a superior salary and benefits package including profit sharing, major medical/life/health/dental insurance, tuition reimbursement, and relocation assistance.

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- DB/DC PROFESSIONALS
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- TECHNICAL COMPUTING ENGINEERS
- EXPERIENCED ANALYSTS/PROGRAMMERS
- TRAINING SPECIALISTS
- 8100 SPECIALISTS

If you are interested in our overseas positions, please send your detailed resume, professional and personal details and objectives, and earning expectations to:

GECI

Head Office	Suite 407
Tour Winterthur	CC Box 99-838
Cedex 16	Carlton Centre
92095 Paris La Defense	Commissioner Street
France	Johannesburg 2000 SA
Telex: ALSMAG 612124F	S-3739 SA
Tel: (1) 776.79.46/1	(011) 331-3841

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We are proud of our State and proud to serve Arizonans. As more businesses and industries locate here, Arizona Public Service Company faces increasing challenges. We welcome professionals who can help us grow.

Our Corporate Models Development Department has openings for Programmers with experience in Fortran, IMS, and TSO/SPF. A knowledge of PLI and SAS or Mark IV would be helpful. You would provide both design and development and support for our Decision Support, Financial Planning and Engineering Systems. 3 to 5 years experience on a large scale computer system is required.

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ARIZONA PUBLIC SERVICE COMPANY
P.O. Box 21666, Station 1102 CW0123
Phoenix, Arizona 85036

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FACULTY POSITIONS COMPUTER SCIENCE/ MATHEMATICS

Three positions are anticipated in the Mathematics and Computer Science Department for the Fall semester of 1984. One or more of the anticipated openings may become tenure track positions.

Applicants for the Computer Science positions must have at least a Master's degree in Computer Science and be prepared to enroll in a Ph.D. program. Applicants for the Mathematics positions must have a Ph.D. in Mathematics. Appointments will be made at the Assistant or Associate Professor rank commensurate with experience. Teaching responsibilities shall include upper-level undergraduate courses in computer science and/or mathematics, along with traditional introductory and service courses. Candidates with specialized qualifications in both areas offer the greatest flexibility. New computing equipment currently being acquired will provide extensive support for separate administrative and academic systems.

Millersville University is the oldest of the 14 universities of the Pennsylvania State System of Higher Education. The campus is located in a suburb of historic Lancaster, oldest inland city in the U.S. Located less than three hours from New York City, Washington, D.C., and Philadelphia, it offers a pleasant atmosphere with easy access to the Jersey shore and the Poconos resorts. The department has 24 full-time faculty, and offers a B.S. in Computer Science as well as the B.A. and B.S. degrees in Mathematics. Our programs are well respected in the region and have drawn highly motivated and able students.

Interested applicants should submit resume showing education and experience, transcripts of all graduate and undergraduate courses, and three letters of reference to Dr. James A. Swartz, Chairperson, Department of Mathematics and Computer Science, MILLERSVILLE UNIVERSITY, Millersville, PA 17551. Interviews will begin in mid-February and continue until suitable candidates are selected.

Millersville university seeks and is eager to receive applications from women and minority candidates. Affirmative Action/Equal Opportunity Employer.

COMPUTER SCIENTISTS/COMPUTER SPECIALIST

Center for Programming Science & Technology of the INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY

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- Database Management Technology – Database Management Systems, Database Machines, Distributed Database Technology, Data Administration.
- Application Development Technology – Very High Level Languages, Program Generators, Advanced Software Development Environment.
- Knowledge-based Systems – Expert Assistance System Technology, Application to Software Development.
- Computer Security and Risk Management.
- System Architecture – Microcomputer Software Technology, Micro-Mainframe Link, Distributed Systems.
- Systems Programming – Database Laboratory Software Development.

Graduate degree in computer science or mathematics or equivalent experience with demonstrated ability to conduct research is required. Recent experience commensurate with GM Service grade level in the area or areas of specialization is required.

The computer scientist positions range from GS-9 to GS-14 ($20,966 to $65,539) and the computer specialist position ranges from GS-12 to GS-13 ($30,402 to $46,597) depending upon qualifications and experience, and other competitive salary, excellent career benefits, and other professional growth opportunities. Please send your Personal Qualifications Statement (SF-171) to:

U.S. Department of Commerce
National Bureau of Standards
Administration Building, Room A-123
Washington, D.C. 20234
ATTN: Ms. Jo Wade (640-CW)

The National Bureau of Standards is located in modern facilities in Gaithersburg, MD and is an equal opportunity/affirmative action employer. U.S. citizenship is required.

Head, Library Systems Duke University

Duke University Libraries is seeking a strong individual to plan and coordinate the utilization of new technologies to enhance Duke's present automated systems, while working toward implementation of an on-line, integrated library system. The position requires 3-5 years experience in library automation, preferably in a library environment demanding advanced ability to plan, analyze, program, work and train others, and communicate effectively both orally and in writing; demonstrated knowledge of major computer programming language (COBOL experience with IBM Z Tandem computers preferred), computer hardware, and library automation; supervisory experience and MLS from an ALA accredited program strongly preferred.

Duke has a superior benefits package and offers relocation.

Letter of application and resume should be submitted to:

Library Personnel Office
216 Perkins Library
Duke University
Durham, North Carolina 27706

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SYSTEMS PROGRAMMER

Aggressive Billion $, Sunbelt Bank, expanding its technical staff, seeks IBM Systems Programmer.

Our current environment includes RACF, JCS 2, CICS.

Candidate should possess application programming background and a minimum of three years 4341 MVS systems programming experience. Proficiency with SMP/4 is a plus.

Send resume and salary requirements to:

Southern National Bank of N. C.
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P. O. Box 1489
Lumberton, N. C. 28359

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SOFTWARE ENGINEERS

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Primary responsibilities will include the design and implementation of data management software for the Optical Storage product line. The ideal candidates will be knowledgeable in MVS Architecture, proficient in 370 Assembler language and have direct experience with MVS internals.

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You will be part of a UNIX Programming team involved in the design and implementation of a large scale automated test floor software system written in the C language. Expertise in any or all of the following areas is required: design and implementation of database management systems, manufacturing systems, quality assurance systems, and local area networks. Knowledge of MVS/VM and computer hardware is desirable. BSCS or equivalent is required. Salary and grade will be commensurate with experience.

So, if you like challenging problems, high technology, an atmosphere of experienced professionals and the fast growing future of one of the most dynamic companies in the field, please call Dan O'Reilly collect at (303) 676-3094 or forward your detailed resume to his attention, Storage Technology Corporation, MD FF, Dept. 0123, P.O. 2270 South 88th Street, Louisville, Colorado 80028. Equal Opportunity Employer.

Storage Technology

COMPUTER APPLICATIONS ANALYSTS

Mobil

Mobil Exploration and Producing Services Inc. (MEPSI) provides programming and data processing support to Mobil Oil Corporation's exploration and producing activities worldwide. Several openings are immediately available for experienced, preferably technically oriented, computer applications analysts/programmers. As a member of the Technical Applications Support Group, you will be involved in challenging assignments in support of our engineering and other technical departments.

Preferred candidates should possess:

- Minimum 2-5 years of technical programming experience or equivalent credentials. Oil & Gas industry experience desirable.
- High proficiency in use of IBM OS and/or VM computer systems (MVS, CMS, TSO, FORTRAN, PL/1, JCL, Utilities, FAMVALET, FOCUS).
- BS degree in mathematics, engineering, or other industry-related technical profession.
- Willingness to accept domestic/foreign travel assignments of short duration.

Responsibilities include:

- Interact with units in MEPSI and other worldwide divisions within Mobil to interpret application needs and provide user support.
- Design, develop, implement, and maintain computer programs supporting the various technical departments.
- Write user/programmer support documentation.

Mobil offers the salary and comprehensive benefits package that you expect from an industry leader. Qualified candidates should send their resume to: Carol Redeker, Employee Relations, Mobil Exploration & Producing Services Inc., Dept. CW 123, P.O. Box 900, Dallas, Texas 75221.

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Advisory Systems Engineer - Telecommunication Planning

5-8 years experience in:

- Voice Networking Strategies
- Data Networking Strategies
- Simulation Modeling
- SNA Networking
- X.25 Networking
- Satellite Communications
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- Network Management

Sr. Systems Engineer - Data Administration

3-5 years experience in:

- Logical Modeling
- Userview Consulting
- Data Standardization Consulting
- Logical Model Synthesis
- Information Center Consulting
- Global Model Consulting
- Information Systems Planning
- Data Administration
- Data Security
- Dictionary Administration

Candidates should have a masters or bachelors degree preferably in Mathematics, Computer Sciences, Engineering, or equivalent.

Please submit a detailed resume with salary history to N. Fitzpatrick, Personnel Representative, Dept. CW, GTE Data Services, P. O. Box 1548, DC 136, Tampa, Florida 33601. An Equal Opportunity Employer.

GTE Data Services GTE

Data Processing

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Data Base Manager: Requires BSCS or equivalent with 10 years experience in data base design and administration utilizing IBM 370 and HP 3000. (1130-JD)

Senior Systems Analysts: Requires BSCS or equivalent and 5-plus years experience in manufacturing systems utilizing HP 1000. (1140-JD)

Engineer-CIM: BSCS/Math or equivalent and a minimum of 3 years experience in computer integrated manufacturing applications. Distributed systems graphics and IMAGE experience a plus. Familiarity with HP 3000 desired. (1130-JD)

Senior Engineer-CIM-CAD/CAM: Requires BSCS/EE or equivalent, MS preferred, and a minimum of 5 years experience in CAD/CAM and the use of robotics. Familiarity with machine vision and computer controlled industrial processes desired. (1130-JD)

Senior Engineer-CIM-Computer Communications: Requires BSCS/EE or equivalent, MS preferred, and a minimum of 5 years experience in the implementation of computer communications. Requires at least 3 years experience in HP distributed systems, specifically DS-1000. Knowledge of HP 1000 RTE internals strongly desired. (1130-JD)

Senior Staff Engineer-CIM: Requires BSCS or equivalent, MS preferred, and a minimum of 5 years experience with large real time systems. Familiarity with distributed systems and strong system integration skills are essential. HP 1000 experience desired. (1130-JD)

North Carolina is a place where you can enjoy the high-technology challenge along with a scenic drive in the gently rolling hills, the sight of early morning mist among the pines and the quiet beauty of the nearby Smokies. We'll pay for your relocation and provide you with competitive compensation. Send your resume in confidence to the address below.

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AMERICAN DIVERSIFIED

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Degreed professional with 5 years' data processing experience to supervise systems programming team, monitor system performance, maintain computer security and assist in hardware/system software selection and implementation. B.A. degree.

MANAGER, APPLICATIONS DEVELOPMENT

Full responsibility for corporate applications development. Must have 5 years' experience as skilled manager with heavy project planning, capable of supervising a team of systems analysts and programmers. Perform project planning, estimating and control. B.A. degree.

MANAGER, HARDWARE AND COMMUNICATIONS

Hardware and communications expert with a B.S. or B.A. in electronics and experience in the computer field to manage technicians team installing and maintaining computer, peripheral, telephone and communications equipment in our Costa Mesa based corporate office and area offices nationwide.

SYSTEMS PROGRAMMER

Thorough understanding of VAX internals to create and maintain system software, utility programs and application subroutine libraries. Will perform data base design, monitor overall system performance and provide technical assistance to the application programming staff.

SENIOR SYSTEMS ANALYST

Surveys, identifies and evaluates user requirements including developing building/contractor applications, requirements, program specifications, schedules, training materials, support and maintenance. Must be experienced in make/buy decisions and vendor negotiations.

PROGRAMMER/ANALYST

Performs detailed program design and implementation. Ability to assist in systems specifications and design preparation desirable.

SUPERVISOR, COMPUTER OPERATIONS

Computer operations experience should include shutdown/startup and system/users maintenance. Requires 2 years' college, 5 years' data processing experience and 3 years as computer operations supervisor. Requires knowledge of DCL command language.

ELECTRONICS TECHNICIAN

Knowledge of digital circuits and familiarity with oscilloscope and data line monitor for troubleshooting and diagnosis. This position involves installation and maintenance of terminals, modems, data concentrators, printers and other digital equipment.

Please send resume with salary history to:

Donna Mize
AMERICAN DIVERSIFIED COMPANIES
3200 Park Center Drive - Suite 1500
Costa Mesa, CA 92626

PROJECT MANAGER

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Barbara McGraw
NALGE COMPANY
Division of Sybron Corp.
75 Panorama Creek Drive
Rochester, NY 14602

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DIRECTOR COMPUTING AND INFORMATION SERVICES
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The University of Georgia invites applications and nominations for Director of the Office of Computing and Information Services, Responsibilities include management of the computing facilities (an IBM 3081D, two IBM 3081/168 AP systems, two VAX 780's, a CDC CYBER 855, a CDC CYBER 760, and a CDC CYBER 205), and a staff of 65. Qualified applicants should have at least five years supervisory and managerial experience in a large academic computing facility, a working knowledge of telecommunication networks and distributed data processing, appropriate technical background in computer systems and their uses, excellent oral and written communications skills, and should hold a degree from a recognized institution of higher education. Please submit resume, with references and salary requirements, postmarked by March 1, 1984 to: Dr. James B. Kennedy, Chairman, Screening Committee, Academic to the President, Office of the University of Georgia, Old College, Athens, GA 30602.

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PIA - OS/MVS/IMS/COBOL	35K
PIA - DOS/VSE/ADABAS	35K
PIA - MVS/CICS/BANKING	35K
TECH SUPP - GCOS 3 or 8/LSS	35K
PROG SUPP - DOS/VSE/HOSPITAL	35K
PIA - SYS34 - MAPICS - RPG II	35K
DBA - IMS and utilities	35K
SYS PROG - VM/SP/SYSGENS yrs	35K
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SR PTI - TANDEM/TAL/COBOL	35K

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1211 N. Westshore Blvd.
Tampa, FL 33607
(813) 870-4101

SYSTEMS PROGRAMMER

Southeast Location

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Qualified candidates should possess 3-5 years experience in systems programming, including exposure to IMS DB/DC systems, communications techniques and job entry subsystems.

We offer an excellent salary and benefits package. If your experience matches our requirements, we'd like to hear from you. For further information, send your resume and salary requirements to:

CW-B4334
Computerworld
Box 880
Framingham, MA 01701

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Operations Manager

Anchorage, Alaska

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Duties will include direct supervision over technical staff and all phases of operation including computer operations, tape library functions, data control functions and data entry functions. Experience on Burroughs medium systems is a plus but not required. Full range of benefits offered.

For immediate consideration CALL John Wright COLLECT at (907) 271-4870 or, forward your resume to:

prc
Planning Research Corporation
701 C Street, Box 60
Anchorage, AK 99513

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ASSISTANT DIRECTOR OF ACADEMIC SERVICES
UNIVERSITY OF NEVADA SYSTEM COMPUTING CENTER
(Position located on the University of Nevada Las Vegas campus)

This position will assist in directing the full time professional staff in newly instructional academic computing and operation support services and administrative functions for the UNSCC's Amdahl site. The site provides computing power for academic classes statewide, on machinery which includes a CDC CYBER 170, 2 Honeywell 6000's, and a DEC VAX 11/780.

The successful candidate will have at minimum a Master's Degree (with Ph.D preferred) and significant computer experience in the area of educational delivery. Experience in computer support, communications, networks, and the supervision of others will also be considered.

Application deadline: March 9, 1984.
(Position to be filled on or before July 1, 1984)

Send resume and salary requirements to:

Mark Reed, Acting Director
University of Nevada
System Computing Center
Business Building, 3rd Floor
4505 Maryland Parkway
Las Vegas, NV 89154

Copies of transcripts and three letters of recommendation will also be required for a complete application.

The University of Nevada System is an equal opportunity employer and does not discriminate on the basis of race, creed, color, sex, age, national origin, handicap, or veterans status in any program or activity it operates.

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Or, if you can't call, send your resume to: Employment Office, Digital Equipment Corporation, Dept. 0123 3004, 360 Interstate North Parkway, Atlanta, GA 30339.

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SYSTEMS PROGRAMMER

Our expanding Data Center is looking for an addition to its Technical Support staff. The ideal candidate will have at least 2 years' experience in database and data communications.

CICS and IDMS experience a plus.
Systems configuration: 4Mb 3083 MVS/SP, CICS, JES2 SMS.

Please send resume with salary history in complete confidence to:

Personnel Director

PEERLESS INSURANCE COMPANY
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62 Maple Ave., Keene, NH 03431

SYSTEMS PROGRAMMER

Cerro Metal Products a leading non-ferrous metal producer has an immediate opportunity available for a Systems Programmer. Individual must have IBM 4341, DOS/VSE-/CICS/DL-1 and Assembler language experience. Degree preferred.

Located near Penn State University in beautiful central Pennsylvania recreation area of for an excellent fringe benefit package. Submit resume and salary history in confidence to:

Thomas J. Magee, Manager
Industrial Relations
CERRO METAL PRODUCTS
P.O. Box 388
Bellefonte, PA 16823

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- **SYSTEMS ANALYSTS**
- **ANALYST PROGRAMMERS**
- **PROGRAMMERS**
- **TECHNICAL SUPPORT**
- **FIELD ENGINEERS**
- **QUALITY ASSURANCE ANALYST**
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...DISTRIBUTION - Distribution Inventory Management, Transport Optimization, Automated Materials Handling, Space Utilization

...SHOWROOMS - In-store Inventory Management and Reporting, Financials, Personnel, State-of-Art Point-of-Sale with Complex Telecommunications Interfaces

...FINANCIAL - Fixed Assets, Cash Management, Automated Payables, General Ledger, Payroll, Accounts Receivable

...MERCHANDISING - Advertising, Replenishment, Product Class, Purchase Orders, Treasury

...SYSTEMS SOFTWARE/PROGRAMMING - Honeywell DPS-3 (Real Soon!), DPS-6 (Real Soon!) under GCOS-4/DS, DPS-6/47 under GCOS 6-DS/DPS, DPS-6, and Stratus Non-Stop

...PLANNING - Data Hardware and Software - Resources Evaluation, State-of-the-Art Technology Assessment, Product Reviews, Long-Range Planning

...QUALITY ASSURANCE ANALYST - Perform QA reviews on new Development Projects, Develop and Implement Systems and Programming Standards

...TRAINING - Professional Instruction for COBOL, BASIC, Structured Design, DB8-TP and Data Base Design

...STAFF SUPPORT - Provide Operational Analysis, Budget and Expense Control, Planning and Administrative Support to MIS Organization

Applicants with college training in Computer Science or Business Information Systems desired, and a minimum of 2 years experience in Systems and Programming. Proficiency in BASIC and COBOL is required.

We also have openings for qualified

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The successful candidates will have experience with Hard Disks and Digital Logic Circuits.

We offer an above-average salary, commensurate with experience. Our Benefits Package includes Major-Medical, Hospitalization, Dental, Optical & Life Insurance, Retirement Plan, Profit Sharing, PAID RELOCATION, and much more.

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Send detailed resume and names of three references to: Chairperson, CIS Search and Screen Committee, Bloomsburg University, Navy Building, Box 1705, Bloomsburg, PA 17815 postmarked by April 15, 1984.

Bloomsburg University is located in Northeastern Pennsylvania. It is a one-hour drive to the Poconos Mountains, three hours to New York or Philadelphia and an easy drive to all of New England and Canada.

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We are seeking an internal consultant to function as liaison between MIS and a diverse user community for a major East Coast manufacturing company. A degree and 2+ years experience with microcomputers (knowledge of IBM or compatible PC's required) and mainframe software is required. This position will provide technical consulting on PC's to both MIS and user personnel and will evaluate new micro hardware and software for the Information Center. Personnel resources

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1984

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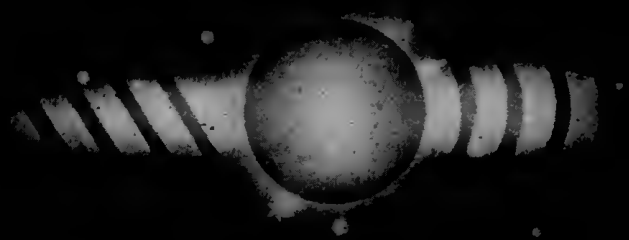

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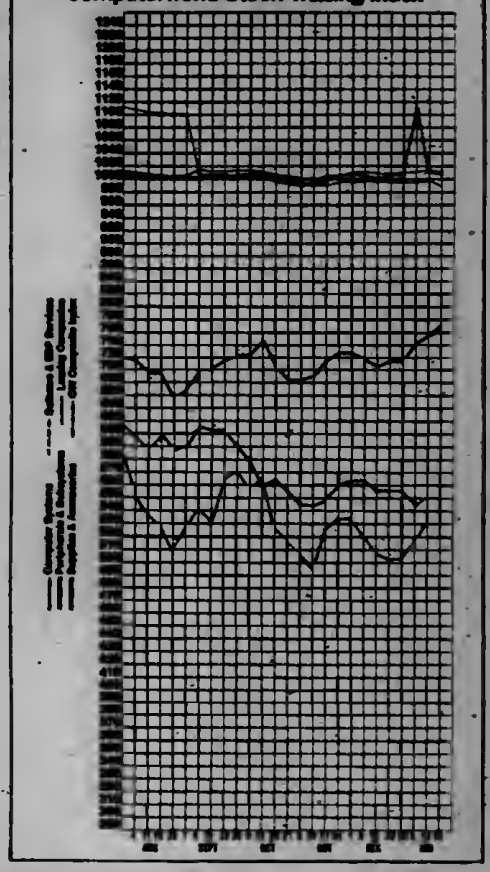
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 18, 1984

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

		1983-84 RANGE (1)	CLOSE JAN 18 1984	WEEK NET CHANGE	WEEK PCT CHANGE
O	ALPHA MICROSYSTEMS	11- 35	17	- 1/2	-2.8
O	ALTOS COMPUTER SYST	8- 28	11 1/8	+ 1/8	+1.1
O	AMDAHL CORP	9- 30	10 1/2	+ 3/8	+3.6
O	APPLE COMPUTER INC	10- 83	35 3/4	+ 3/4	+2.1
O	AT&T	50- 70	61 3/8	+1 5/8	+2.6
O	BURROUGHS CORP	72- 95	81 1/4	- 1/4	-0.3
O	COMPUTER AUTOMATION	6- 17	6 1/4	+ 3/4	+13.6
O	COMPUTER CONSOLES	6- 20	10 3/8	- 3/8	-3.5
O	CONTROL DATA CORP	21- 63	60	+1 1/8	+1.9
O	CONVERGENT TECHNOL	10- 41	29 3/8	- 3/8	-1.4
O	CRAY RESEARCH INC	20- 38	37	+1 1/8	+3.1
O	DATA GENERAL CORP	18- 47	47	+1 1/2	+3.3
O	DATAPOINT CORP	11- 36	35 3/4	+1 1/8	+3.3
O	DIGITAL EQUIPMENT	72-133	128	+10 3/4	+9.1
A	DSCO INC	6- 18	18 3/4	0	0.0
O	ELECTRONIC ASSOC.	5- 13	8 1/8	- 3/8	-4.4
O	FLOATING POINT SYST	18- 46	38 1/4	-1 3/8	-3.5
O	FONAMO	22- 47	35	+ 1/8	+0.3
O	GENERAL AUTOMATION	5- 20	18 3/8	+ 1/8	+0.7
O	GOULD INC	28- 38	35 1/2	+1 3/8	+4.7
O	HARRIS CORP	20- 51	41 7/8	+2 3/8	+6.0
O	HEWLETT-PACKARD CO	22- 38	44 5/8	+3	+7.2
O	HONEYWELL INC	80-135	128 3/4	+3 3/8	+2.6
O	IBM	97-138	128 1/8	+1 3/4	+1.4
O	IPL SYSTEMS INC	0- 16	9 3/4	- 1/4	-2.5
O	M/A-COM INC	10- 36	20 7/8	- 1/8	-0.5
O	MAGNUSON COMP SYSTS	1- 8	3/8	0	0.0
O	MANAGEMENT ASSIST	7- 22	20 3/4	+2	+10.6
O	MATRIX/HITE ELECTRONI	97- 99	81 1/2	- 3/8	-0.4
O	MODULAR COMPUTER SYS	0- 10	8	+ 1/2	+6.6
O	PERKIN 3070 301	10- 18	16 3/8	+ 1/8	+0.1
O	MOTOROLA INC	82-165	132 1/4	+2 1/8	+1.6
O	NAT'L SEMICONDUCTOR	10- 24	20 1/8	- 1/8	-0.6
O	NCR	39-138	135	+ 7/8	+0.6
O	PERKIN-ELMER	17- 57	38 3/4	+1	+2.3
O	PRIME COMPUTER INC	17- 37	30 3/4	+2 1/8	+7.4
O	SPERRY CORP	21- 38	36 1/4	- 3/8	-1.0
O	TANDEM COMPUTERS INC	21- 53	37 1/2	+1	+2.6
O	TANDY CORP	39- 85	67 3/4	+ 7/8	+1.3
O	TELEVIDEO SYSTEMS	4- 41	6	+ 1/4	+1.5
O	TELXON CORP	0- 10	8 3/4	- 5/8	-6.6
N	TEXAS INSTRUMENTS	71-138	141 1/2	+2 1/2	+1.9
O	ULTIMATE CORP	9- 28	20 5/8	+1 1/2	+7.8
O	VECTOR GRAPHICS INC	0- 14	8	0	0.0
O	WANG LABS "B"	18- 62	35	-1	-2.7
O	WANG LABS "C"	11- 32	26 3/4	-1 3/8	-4.8
N	WEBB CORP	23- 52	30 3/4	- 3/8	-0.7

LEASING COMPANIES

O	BOOTHE FINANCIAL CP	11- 25	24	- 1/8	-0.7
O	COMDISCO INC	7- 33	14 5/8	-9 1/8	-38.5
O	CONTINENTAL INFO SYS	5- 18	7 3/4	-1 1/8	-12.6
O	IMP INC	5- 18	14 3/4	+ 7/8	+6.3
N	U.S. LEASING	18- 47	38 5/8	+ 1/4	+0.6

COMPONENTS

N	ADVANCED MICRO DEV	13- 57	30 3/4	+ 1/8	+0.3
N	BMC'S SEMICONDUCTOR	10- 38	30 3/4	-1	-3.8
O	ANALOG DEVICES INC	19- 38	37 5/8	-1 1/8	-2.9
O	ANALOGIC CORP	20- 27	23 1/4	-1 3/4	-7.0
O	APPLIED MAGNETICS CP	16- 37	27 1/4	-1 1/8	-3.9
O	TERADYNE	14- 38	36 1/2	- 1/2	-0.3

EXCH: O=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=REGIONAL; N=NASDAQ; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) IN NEAREST DOLLAR

SOFTWARE & EDP SERVICES

		1983-84 RANGE (1)	CLOSE JAN 18 1984	WEEK NET CHANGE	WEEK PCT CHANGE
N	ADVANCED COMP TECH	1- 8	3 3/4	- 1/8	-3.2
N	ADVANCED SYSTEMS INC	6- 23	18 3/4	+1 1/4	+7.1
O	ASK COMPUTER INC	6- 38	36 3/4	+1	+2.8
O	AVERICOM SOFTWARE	17- 31	18 3/4	- 1/4	-1.3
O	BASEVIEW INC	0- CO	8 1/8	- 1/8	-1.7
O	ANALYSTS INTL CORP	6- 24	12 3/4	- 1/4	-1.9
O	APPLIED DATA RES.	6- 27	20 1/8	+1 1/4	+6.2
O	BMS COMPUTING SYSTEMS	0- 21	15	0	0.0
O	ASTRONYME CORP 120	1- 7	7 3/4	- 1/4	-3.3
O	AUTOMATIC DATA PROC	31- 44	38 1/8	+1 3/4	+4.1
O	CULLINET SOFTWARE	6- 17	12	- 1/8	-1.0
O	COMPUTER ASSOC INT'L	9- 30	27 1/8	- 1/8	-1.8
O	COMPUTER BUSINESS	0- 28	18 1/8	+ 1/4	+1.8
O	COMPUTER METHODS	5- 15	7 1/4	+ 1/4	+3.8
O	COMPUTER SCIENCES	11- 24	21	+ 1/2	+2.4
O	COMPUTER TIME SHARE	0- 10	3/8	1/2	+10.6
O	COMPUTER VISION	6- 25	11 7/8	+ 1/8	+12.6
O	COMPUTING SYSTEMS	0- 20	7 1/2	- 3/4	-9.0
O	COMSHARE CORP	5- 20	7	- 1/2	-7.0
O	COMVERGE	7- 14	11 3/4	- 3/4	-6.0
O	CULLINET SOFTWARE	19- 34	30 1/2	-1 3/8	-4.3
O	CYGNUS SYSTEMS 120	0- 17	10	0	0.0
O	ELECTRONIC DATA SYST	19- 42	30 1/2	-1	-3.7
O	HOUSE SYSTEM INC	18- 52	22 3/8	+ 3/8	+3.4
O	GENERAL ELECTRIC CO.	46- 58	56 3/4	-1 1/8	-1.9
O	GTE CORP	24- 38	33	- 1/4	-0.7
O	INFORMATICS 120	20- 34	32 3/4	+1 1/2	+7.0
O	INFOTRON SYSTEMS COR	26- 39	38	+1	+2.8
O	KANE ASSOCIATES	4- 10	8 1/2	+ 1/4	+3.0
O	LOGICON	9- 31	28 1/8	+ 1/8	+0.4
O	MCI COMMUNICATIONS	13- 38	17 3/4	+ 3/8	+2.1
O	MGMT MCI AMER INC -	0- 23	21 3/4	-1 1/4	-5.4
O	MATHEMATICA, RSP LAB	7- 22	11 1/2	0	0.0
O	MICRO SYSTEMS INC	20- 64	54 3/4	- 1/4	-0.2
O	MORTHIA HERES TR	0- 0	0	0	0.0
O	3011 Omni 3070 COMP	0- 38	18 1/2	+ 3/4	+0.0
O	ON-LINE SOFTWARE INT	17- 27	17	0	0.0
O	PANSOPHIC SYSTEMS	0- 30	10 3/8	- 1/2	-2.0
O	PLANNING RESEARCH	0- 20	12 1/4	+ 3/4	+3.1
O	POLICY MGMT SYSTS CP	15- 38	28 3/4	- 1/8	-1.7
O	PROGRAMMING & SYS	1- 8	5 1/8	0	0.0
O	REYNOLDS & REYNOLD	17- 52	38 1/8	- 3/4	-1.9
O	301 CORP	11- 38	30 1/8	-1	-3.7
O	SHARED MEDICAL SYST	13- 43	33 1/4	-2 1/4	-6.7
O	SCIENTIFIC COMPUTERS	0- 16	11	- 1/4	-2.2
O	SOFTWARE 30	13- 37	18 1/8	+ 3/8	+2.7
O	TYMSHARE INC	11- 30	20 1/2	+ 1/2	+2.5
O	UNI CORP	0- 10	10 3/4	+ 1/8	+0.8
O	WYLY CORP	7- 17	16 5/8	+ 1/8	+1.1

PERIPHERALS & SUBSYSTEMS

O	3M INTERNATIONAL	0- 7	4 3/8	- 1/8	-0.7
A	ANDERSON JACOBSON	9- 28	18 1/4	-1 1/4	-10.0
O	ANTIN-TROL TECHNOLOGY	0- 25	20 5/8	- 1/2	-1.0
O	BANCTEC INC	7- 33	33	- 3/4	-2.7
O	BERKEYE INT'L	0- 10	8	+ 1/4	+2.0
O	BOLT, BERANEK & NEW	0- 24	24	-1	-4.0
O	CAMDEX CORP	1- 4	1 1/8	0 1/8	+20.0
O	CENTRONICS DATA COMP	0- 28	18 1/8	+0 3/8	+19.0
O	CISTEC CORP	6- 19	18 7/8	+ 1/8	+1.1
O	COMPUTRONICS	3- 26	18 3/8	-1 1/8	-10.0

SUPPLIES & ACCESSORIES

O	COMPUTER SERVICES INC	1- 21	7/8	-	-0.0
O	COMPUTER TRANSCRIBER	4- 13	6 1/4	- 5/8	-12.0
O	COMPUTERM-16120 CORP	10- 38	68 1/8	+4 1/8	+3.4
O	TYMDRIC CORP	10- 38	17	+ 5/8	+3.8
O	DATAPRODUCTS CORP	10- 61	38 1/2	+ 1/4	+0.6
O	DATRAN CORP	0- 10	10 5/8	+ 1/8	+1.1
O	DATA SWITCH CORP	13- 61	33	+1	+3.2
O	DETRAN INC	2- 17	6	- 3/8	-5.0
O	DIGITRON DATA CORPOT	3- 18	11 7/8	- 5/8	-5.0
O	DIGITEL HLTHCTRL	11- 38	13 3/8	-	-0.0
O	ELECTRONIC S & S	0- 11	3 3/8	- 5/8	-8.4
O	INNOVATION, INC	11- 16	12 1/4	+1 1/8	+11.3
O	PYRAMID TECHNOLOGY	10- 68	38 3/4	+1 1/4	+3.3
O	QUANTUM TECHNOLOGIES	0- 12	8 3/4	+ 1/8	+1.2
O	REVAL DATA CORP IND	0- 35	38 7/8	+ 1/8	+0.3
O	SARAH DATAMEST IND	1- 8	3/4	0	0.0
O	SKYLYNE CORP	7- 31	25 3/4	+7 3/8	+28.1
O	[illegible] CORP	3- 18	6 1/8	0	0.0
O	TYMSHARE INTL INC	10- 22	19	+ 1/2	+2.1
O	INFORMATION GENIUS	12- 17	13 1/8	0	0.0
O	3DRILL CORP	11- 48	38 1/4	-2 1/4	-5.6
O	3M SYSTEMS INC	0- 14	8 3/8	+ 1/2	+6.4
O	LANDY ELECTRONICS	7- 18	11 7/8	0	0.0
O	NORDBEST CORP	0- 12	11 1/2	+ 3/4	+7.1
O	301 DATA CORP	18- 37	38 3/8	- 3/8	-2.0
O	NAGUSA CORP	0- 38	38 7/8	+ 1/8	+0.3
O	NETWORK SYSTEMS CORP	0- 38	38	+ 1/8	+0.3
O	PA AMERICAN PHILTYE	67- 38	38 1/2	- 1/2	-0.6
O	SOUTHERN TELECOM LTD	22- 38	38	- 1/8	-0.3
O	QWIX	3- 8	8 1/8	0	0.0
O	PARADYNE CORP	19- 38	38	+1 3/4	+10.7
O	ACHWIL CORP	7- 18	18 1/4	+ 3/8	+4.8
O	PHOENIX AMERICAN INC	7- 17	11 1/4	- 1/8	-4.2
O	PLESSEY CO (ADR)	23- 41	38 3/8	-1 1/8	-3.8
O	PRINTRONIX INC	23- 38	27 1/8	-1	-3.5
O	SANTEX CORP	9- 38	11 3/4	0	0.0
O	RAYTHEON CO	33- 38	38	+1 1/8	+2.3
O	RECOGNITION EQUIP	6- 17	13 3/8	+ 1/8	+1.0
O	RELM CORP	60- 38	47 1/8	+2 1/8	+3.0
O	SANDERS ASSOCIATED	17-128	41 1/4	-1 3/4	-4.2
O	SCAN 3070	1- 3	3/8	0	0.0
O	SCAN-TRON CORP	12- 18	13 1/4	0	0.0
O	SCIENTIFIC ATLANTA	19- 38	38	0	0.0
O	STORAGE TECHNOLOGY	13- 33	18	- 1/8	-0.6
O	STRAT 3DTAIPSONICS	4- 27	6 3/8	+ 1/8	+2.0
O	SYSTEMS & COMP TECH	26- 38	38 1/4	+1	+2.6
O	T SYS INC	7- 17	10 1/8	- 1/8	-1.2
O	TEI PRODUCTS CO	0- 38	38 1/4	+ 1/8	+0.3
O	TANDON CORP	10- 38	38 3/4	+ 1/8	+0.3
A	TEC INC	0- 12	8 1/2	+ 1/8	+1.7
N	TEKTRONIX INC	34- 87	78 3/8	+ 1/8	+0.2
O	TELEX	0- 38	27	- 1/8	-0.5
O	TESDATA SYSTEMS CP	3- 17	7 5/8	+ 7/8	+12.2
O	TRIPLEX INC	7- 29	21 5/8	+ 1/8	+0.5
O	VISUAL TECHNOLOGY	0- 38	18 3/4	0	0.0
O	AMERICAN BUS FORMS	7- 23	21 3/8	+ 1/8	+1.1
O	BARRY WRIGHT	13- 37	32 1/2	0	0.0
O	DUPLEX PRODUCTS INC	12- 27	20 3/8	- 1/8	-0.6
O	ENNIS BUS. FORMS	0- 38	23 1/4	- 5/8	-2.6
O	3M COMPANY	28- 96	84 3/8	+2 1/2	+3.0
O	MOORE CORP LTD	38- 51	42 1/4	- 1/4	-0.5
O	STANDARD REGISTER	11- 38	38 3/4	+ 1/2	+1.3
O	WALLACE BUS FORMS	11- 38	38 1/4	+ 1/8	+0.3

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